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TRANSACTIONS

OF THE

AMERICAN HOMŒOPATHIC OPHTHALMOLOGICAL, OTOLOGICAL, AND LARYNGOLOGICAL SOCIETY.

SESSION 1899.

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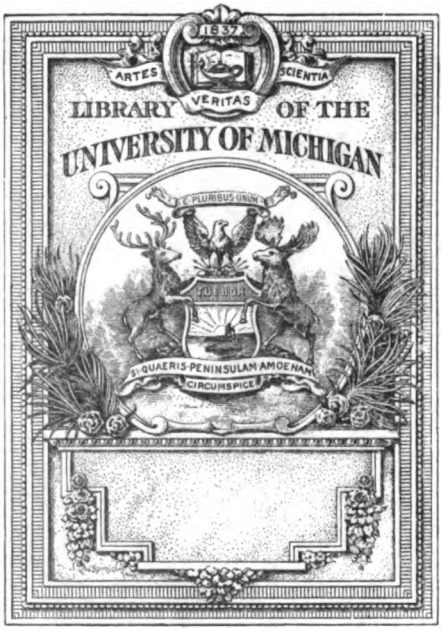

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roup of a few of the members of The American Homœopathic, Ophthalmological, Otological and Laryngological Society present at its Twelfth Annual Session at Atlantic City, N. J.

1. Dr. E. J. Bissell, Rochester, N. Y., President.
2. Dr. E. W. Beebe, Milwaukee, Wis., 1st. Vice-President.
3. Dr. Herbert D. Schenck, Brooklyn, N. Y., Secretary.
4. Dr. Charles Helfrich, New York, N. Y., Treasurer.
5. Dr. Edward Beecher Hooker, Hartford, Conn.
6. Dr. George B. Rice, Boston, Mass.
7. Dr. John B. Garrison, New York, N. Y.
8. Dr. A. W. Palmer, New York, N. Y.
9. Dr. Charles Deady, New York, N. Y.
10. Dr. Sayer Hasbrouck, Providence, R. I.
11. Dr. Joseph M. Patterson, Kansas City, Mo.
12. Dr. Alton G. Warner, Brooklyn, N. Y.
13. Dr. Howard P. Bellows, Boston, Mass.
14. Dr. Charles Leslie Rumsey, Baltimore, Md.
15. Dr. C. H. Vilas, Chicago, Ill.
16. Dr. J. N. Anderson, Toronto, Ont.
17. Dr. Benjamin S. Stephenson, Lowell, Mass.
18. Dr. George W. McDowell, New York, N. Y.
19. Dr. Bushrod W. James, Philadelphia, Penn.
20. Dr. William A. Phillips, Cleveland, O.
21. Dr. George A. Suffa, Boston, Mass.
22. Dr. F. Park Lewis, Buffalo, N. Y.
23. Dr. Irving Townsend, New York, N. Y.
24. Dr. Gustave A. Mueller, Pittsburgh, Penn.
25. Dr. Herbert W. Hoyt, Rochester, N. Y.
26. Dr. Fred. D. Lewis, Buffalo, N. Y.
27. Dr. George M. Haywood, Rochester, N. Y.
28. Dr. Thomas L. Shearer, Baltimore, Md.
29. Dr. Wm. R. King, Washington, D. C.
30. Dr. A. B. Norton, New York, N. Y.
31. Dr. Henry H. Leavitt, Minneapolis, Minn.
32. Dr. E. H. Linnell, Norwich, Conn.
33. Dr. Pierre Colon Moriarty, Omaha, Neb.
34. Dr. Frank D. W. Bates, Hamilton, Ont.

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TRANSACTIONS

OF THE

AMERICAN HOMŒOPATHIC OPHTHALMOLOGICAL, OTOLOGICAL AND LARYNGOLOGICAL SOCIETY.

W243

TWELFTH ANNUAL MEETING.

ATLANTIC CITY, N. J.

JUNE, 1899.

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OFFICERS, 1897.

PRESIDENT:

A. B. NORTON, M.D.....New York City.

VICE-PRESIDENT:

WM. R. KING, M.D.....Washington, D. C.

SECRETARY:

ELMER J. BISSELL, M.D.....Rochester, N. Y.

TREASURER:

HAROLD WILSON, M.D.....Detroit, Mich.

CENSORS:

W. A. DUNN, M.D.....Chicago, Ill.
F. PARK LEWIS, M.D.....Buffalo, N. Y.
W. A. PHILLIPS, M.D.....Cleveland, O.

OFFICERS, 1898.

PRESIDENT:

WM. R. KING, M.D.....Washington, D. C.

VICE-PRESIDENTS:

THOMAS L. SHEARER, M.D.....Baltimore, Md.
HOWARD P. BELLOWS, M.D.....Boston, Mass.

SECRETARY-TREASURER:

CHARLES H. HELFRICH, M.D.....New York City.

CENSORS:

E. W. BEEBE, M.D.....Milwaukee, Wis.
E. J. BISSELL, M.D.....Rochester, N. Y.
R. S. COPELAND, M.D.....Ann Arbor, Mich.
A. B. NORTON, M.D.....New York City.
GEO. H. QUAY, M.D.....Cleveland, O.

OFFICERS, 1899.

PRESIDENT:

ELMER J. BISSELL, M.D.....Rochester, N. Y.

VICE-PRESIDENTS:

E. W. BEEBE, M.D.....Milwaukee, Wis.
C. GURNEE FELLOWS, M.D.....Chicago, Ill.

SECRETARY:

HERBERT D. SCHENCK, M.D.....Brooklyn, N. Y.

TREASURER:

CHARLES H. HELFRICH, M.D.....New York City.

CENSORS:

EDWARD B. HOOKER, M.D.....Hartford, Conn.
D. A. MacLACHLAN, M.D.....Detroit Mich.
GEO. B. RICE, M.D.....Boston, Mass.
THOMAS M. STEWART, M.D.....Cincinnati, O.
ISAAC C. SOULE, M.D.....Freeport, Ill.

OFFICERS FOR YEAR 1900.

PRESIDENT:

HOWARD P. BELLOWS, M.D.....Boston, Mass.

VICE-PRESIDENTS:

C. J. SWAN, M.D.....Chicago, Ill.
E. L. MANN, M.D.....St. Paul, Minn.

SECRETARY:

HERBERT D. SCHENCK, M.D.....Brooklyn, N. Y.

TREASURER:

CHARLES H. HELFRICH, M.D.....New York City.

CENSORS:

J. H. HARVEY, M.D.....Toledo, O.
G. H. QUAY, M.D.....Cleveland, O.
P. C. MORIARTY, M.D.....Omaha, Neb.
C. L. RUMSEY, M.D.....Baltimore, Md.
O. L. SMITH, M.D.....Chicago, Ill.

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PROCEEDINGS

OF THE

TWELFTH ANNUAL MEETING OF THE AMERICAN HOMŒOPATHIC, OPHTHALMOLOGICAL, OTOLOGICAL AND LARYNGOLOGICAL SOCIETY, HELD IN ATLANTIC CITY, N. J., JUNE 19TH AND 20TH, 1899.

FIRST DAY.—MORNING SESSION.

The society met in the Hotel Dennis, and the first session was called to order at 10.40 A.M., Monday, June 19th, by the President, Dr. Elmer J. Bissell, with the following remarks: Previous to giving my Annual Address, I wish to say that I concluded after looking over the long program that you came here to hear each other rather than to hear me. I have, therefore, reduced my address to very small proportions, in order that you may have a longer time for the exchange of thoughts among yourselves.

Dr. Bissell then presented the President's Address, and followed it by declaring the Society open for the transaction of business.

Dr. Bushrod W. James: I have been much pleased with this address. It seems to me that it strikes right at the foundation of the usefulness of this Society. The thoughts therein contained are valuable, and I think we ought to have a committee of five appointed to report further upon this address, and bring out any other points which he has suggested in his remarks. I, therefore, move you, sir, the appointment of a committee of five to take into consideration the address and report further. Amended to make the committee consist of three instead of five members, and then carried.

The President then announced that through Dr. King of Washington a photographer had agreed to make a picture of the society on the hotel veranda at the close of this afternoon's session. That a room had been set apart a short distance from the meeting-room for the exhibition of instruments, specimens and photographs, in charge of Dr. Hoyt of Rochester, who requested the members to assist him in getting all their exhibits early in place. He also announced that the

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first three papers on the program would be transferred to the first session on June 20th, and that "Aural Massage" would be the first subject considered, in order to accommodate one of the authors. For the same reason the paper upon "Diseases of the Frontal Sinuses and Anterior Ethmoidal Cells" would be transferred to the session this afternoon, where two of the announced papers were not to be presented. The President also said that where papers had been prepared upon "Aural Massage and Strabismus," which were special subjects arranged for this meeting, that it would break up the continuity not to have all the papers read, and he would therefore depart from the usual rule and have the papers prepared upon these subjects by authors not present read, unless there was some objection offered now, as he believed it would be to the advantage of the Society to hear these particular papers. No objection was made, and it was so ordered.

REPORT OF THE SECRETARY.

Mr. President and Fellow Members:

Your Secretary begs leaves to submit the following report of his work for the past six months:

Soon after assuming office the corresponding members selected at the last meeting, Drs. C. Knox Shaw and Dudley Wright of London, England, and Dr. Parenteau of Paris, France, were each notified of their election. Dr. Parenteau did not reply to his letter of notification or to one sent by the President later. The following replies were received from Drs. Shaw and Wright:

19, Upper Wimpole st., W., LONDON, Feb. 16, '99.

DEAR SIR: I have much pleasure in acknowledging the honor conferred upon me by your society, in electing me one of its corresponding members. I have never yet visited America, but am hoping, each year, to be enabled to do so. Unfortunately, I do not see my way to getting over this year, but I hope one day to get to one of your interesting meetings. I am, dear sir, yours sincerely,

C. KNOX SHAW.

19, Upper Wimpole st., W., LONDON, March 13, '99.

DEAR DR. BISSELL:

It is with great reluctance that I have to reply to your very kind invitation by saying that I shall be unable to get over to your meeting

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this year at Atlantic City. I have a very great longing to pay your country a visit, and to meet some whose acquaintance it has been my pleasure to make in this country, and to see more whom I do not know personally, but whose fame is so well known over here. I am sure I should much enjoy the visit: the many kind letters I have received make my regret the more keen. With kind regards, I am yours fraternally, C. KNOX SHAW.

55, Queen Anne Street, Cavendish Square, W., May 17, 1899.

DR. HERBERT D. SCHENCK:

MY DEAR DOCTOR: I should have acknowledged before this your kind note of February 18th last, acquainting me that the Ophthalmological, Otological, and Laryngological Society of America had done me the great honor of electing me a corresponding member, only I have been waiting until I had written a paper which might be presented to the congress.

Having now accomplished this, I am sending it to you under separate cover, and would beg you to be so good as to convey to the society my sincere thanks for the honor which has been thus conferred upon me.

It is much to my regret that I am unable to join you all in your meeting, and to have the pleasure of becoming personally acquainted with yourself and your colleagues, but it unfortunately happens that our British Homœopathic Congress falls in the same week as your own, and as I am one of those who has promised to speak on one of the papers, I must be present at the meeting.

With my kind regards and sincere good wishes, believe me yours very truly, DUDLEY WRIGHT.

In March a circular was issued, notifying the members of the time and place of this meeting and asking for papers, with a request that the titles be in the hands of the Secretary by April 1st and the completed paper by May 1st. The first request was very generally complied with, but the second was more generally honored in the breach than otherwise, only four of the forty-seven papers which were finally put in the program being at hand before May 5th. Your Secretary would suggest that much expense to the society, some misunderstanding, as well as a very large amount of extra labor, would be spared your officers if the members, in this respect, would in future more carefully arrange their work for the Society.

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On June 5th a circular announcing the methods of obtaining reduced railroad rates for this meeting and other information was sent to all the members with the program of the meeting, which is herewith presented.

At present the society has 134 active members, 3 corresponding members, and one honorary member. Eleven applications for membership have been received up to the present time.

Respectfully submitted,
HERBERT D. SCHENCK, M.D., *Secretary.*

The President: This report will be placed on file, unless otherwise ordered.

Dr. J. L. Moffat: I move the minutes of the last meeting be adopted as published. Carried.

The Treasurer next presented his report.

TREASURER'S REPORT.

Mr. President and Gentlemen of the Society:

I have the honor to make the following report:

American Homœopathic Ophthalmological, Otological, and Laryngological Society,

In account with
Dr. Chas. H. Helfrich, Treas.

Dr.		Cr.	
To balance	$160 74	By stenographer	$65 00
To dues received	421 00	By stenography and printing	37 32
		By printing bills	4 75
		By cut	5 00
		By printing, binding, mailing, etc., Annual Transactions	154 97
		By mailing bills	4 62
		By mailing programs	11 40
		By stationery	4 50
		By postals	3 80
		By transportation committee	6 00
		By printing	43 50
		By treasurer's sundries	9 25
		By secretary's sundries	25 48
		By balance	206 15
	$581 74		$581 74

Balance on hand.....$206 15

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On motion the report was referred to an auditing committee.

The President: Under the head of Appointment of Committees, I will announce that several months ago I asked Dr. J. B. Garrison to act as a Committee on Transportation and Local Arrangements, and I now take pleasure in regularly appointing the man who has done the work. I also announce that I asked Drs. King of Washington, Bellows of Boston, and Rumsey of Baltimore to act as a Press Committee, and I now regularly appoint them.

As a Committee on Attendance Drs. Bates of Hamilton, Haywood of Rochester, and Rumsey of Baltimore are appointed. As an Auditing Committee, Drs. Haywood of Rochester, Suffa of Boston, and Leavitt of Minneapolis. Drs. Shearer of Baltimore, Townsend of New York, and Moriarty of Omaha are made a Committee on President's Address.

Dr. A. B. Norton: I would like to call attention to an action of the Medical Society of the State of Pennsylvania, that has probably been sent to all members of this society, in regard to the relations between the medical profession and opticians. I think we should take some similar action and move that this matter be referred to a committee of three to report at to-morrow morning's session. Carried. Drs. Norton, Moffat, and Vilas were appointed such a committee.

Dr. P. C. Moriarty: In regard to the nomination of officers of this society, I have a standing resolution to offer providing for a standing committee for the nomination of officers. I have had the experience of seeing two societies apparently dying early, dragged into innocuous desuetude, simply because the officers elected were not qualified, capable, and pushing men. I think few of us are as capable of selecting officers as the ex-presidents of the society, who have seen the work of the various men, and know to whom the interests of the Society should be intrusted. The experience of the late war of appointing volunteer officers by the election of companies, has been a very strong argument in favor of selecting men for such positions as are fully qualified for them. As every society depends largely on the caliber of its officers, and as our ex-officers are best capable of passing judgment in this respect, I think we have sufficient reasons for having the ex-presidents nominate our future officers. I, therefore offer the following as a standing resolution:

Resolved, That the committee on the nomination of officers shall consist of all the ex-presidents of the society present at any meeting, provided that in any case less than three be present that the President

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shall appoint from the members present a number sufficient to make the committee consist of three members.

Dr. A. G. Warner: I heartily second this motion of Dr. Moriarty as it seems to me eminently fit that the ex-presidents of this society should form such a committee. They certainly are in a position to know the members and to gauge the necessities of the case better than any other members. Carried.

The President: As there are only two of the ex-presidents here, this resolution imposes upon the President the appointment of a third member of the committee.

Dr. Vilas: Mr. President, there are a good many more than two ex-presidents here.

The President: I was not a member in the early days of the society, and I am very glad to have this matter brought to my attention and corrected.

The Secretary then presented twelve applications for membership which were referred to the Censors for report at first session on June 20th.

The Treasurer presented the resignation of Dr. J. M. Schley of New York, who resigned on account of illness, on motion this was accepted.

The Secretary: Last year notice was given of an amendment to section 1 of article v of the by-laws, which is now offered, to insert, after the word "physician," "endorsed by two members." The section will then read: "Any regularly qualified and reputable physician, endorsed by two members, may be elected to membership in this society." Adopted.

The Secretary: It is suggested that section 1 of article vi be amended by inserting, after the word "In," "Roberts Rules of Order": The section will then read: "The rules governing the deliberations of this Society shall be those found in Roberts' Rules of Order." The latter work is substituted for "Cushing's Manual," which is entirely out of date. Adopted.

The Secretary: It is suggested that section 2 of article vi be amended by inserting, after the word "Secretary," "by April 1st of each year, and completed paper not later than May 1st." The section will then read "No report or paper shall be received by the society in an incomplete or unfinished condition, and the title of any proposed paper shall be forwarded to the Secretary by April 1st of each year, and the completed paper by May 1st." Adopted.

The Secretary: It is suggested that an additional section be added

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to article vi, as follows: "The time allowed for the presentation of any paper shall be twenty minutes. The leading discussion shall not exceed ten minutes, and all other discussions five minutes for each speaker." Adopted.

Dr. Moffat: Mr. President, I notice that the application-blank specifies only the graduation of members. In many of the States the diploma does not license a person to practise medicine. In some it does. I think it would be well for this society to know under what license our applicants are practicing. I, therefore, move to add to the application-blank, after the words "in the year 189..," "and practising under a license of ....., dated 189..." The application-blank would then read: I, ..., residing in ....., State of ....., a graduate of ....., in the year 189.., and practising under a license of ....., dated ....., hereby apply for membership in the American Homœopathic Ophthalmological, Otological and Laryngological Society, and, if elected, agree to comply with its by-laws, rules, and regulations. (Name in full, with all titles.) Address, ... Date, 189...

If the applicant is living in a State where the diploma is all the license that is necessary, he will just state, "I am a graduate of ..... college, in the year ...., and practising under the license of a diploma"; or, he may state, "I am practising under the license of ..... law," and sign the date on which he registered. In New York the first license was simply a requirement that every physician go to the County Clerk's office and sign his name in a book. Now applicants must be licensed by the Regents.

Dr. James: I would amend as follows: "Or a certificate from the Examining Board of the State in which he resides." We don't have a license in our State, except that the law compels a man to pass an examination before he is entitled to practise. The passing of that Examining Board entitles him to that privilege, and should be mentioned in the blank, because some of the other States may have the same method we have in Pennsylvania.

Dr. Moffat: As I understand, that is practically a license. They cannot practice without that examination. Applicants may just recite that in the blank line.

Dr. James: You want the words there to make it clear.

The amendment was lost. On the original motion of Dr. Moffat a division was called for. The motion was carried by a vote of 12 for to 10 against it.

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The President: The first paper will be on "Aural Massage," by Dr. Henry C. Houghton of New York.

Dr. Henry C. Houghton: You will excuse me for prefacing my paper with an apology: First, that I should be the means of a change in the program, which is giving you some inconvenience. It was a matter of positive necessity, beyond my own control, that I should be at Mt. Holyoke College to-morrow morning, which obliged me to make this request. That I may not be misunderstood, allow me to say, also, that before this paper was complete and I was aware of the circumstances, I had already given a promise of this paper to the editor of the *Journal of Ophthalmology, Otology, and Laryngology*. If I have made an error, I feel as though the pledge stood, and I shall be obliged to abide by my word, and hence make this statement before I begin reading the paper.

Dr. Norton: I move that Dr. Houghton's paper be read and accepted by the society, even though it is to be published in other than the official organ of the society.

The President: It is certainly a matter of error.

Dr. Houghton: An error of the head and not of the heart. The motion was carried.

Dr. Henry C. Houghton then read his paper, and followed it with a demonstration of the use of the instrument mentioned.

Dr. Norton then moved that throughout this meeting the courtesies of the floor be extended to all visitors to take part in the discussion of the papers. Carried.

The remainder of the morning hour was taken up with the reading and discussion of the first five papers upon the program, as amended at the beginning of the session.

After this the Secretary presented two additional applications for membership, which were referred to the Censors, after which an adjournment was taken to 2.30 P.M.

First Day.—Afternoon Session.

The meeting was called to order by the President at 2:50 P.M., who announced that the executive committee had decided that it was best to begin this session with the presentation of the remainder of the papers on the program for this morning's session before proceeding with the regular program for this afternoon. The whole session was occupied in the reading and discussion of five papers. At the close of

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the session the President announced that the exhibits were now all in place, except Dr. Boynton's colored plates illustrating various intra-ocular conditions which would be in position to-morrow morning. An adjournment to 8 P.M. was taken at 6 o'clock.

First Day.—Evening Session.

The evening session was called to order by the President at 8.15 o'clock, and was wholly occupied with the reading and discussion of nine papers. An adjournment was taken at 10.48 P.M. until to-morrow morning at 9 o'clock.

Second Day.—Morning Session.

The meeting was called to order by the President at 9.25 A.M.

The Secretary presented three applications for membership, which were referred to the Censors.

The report of the committee appointed to draft a resolution regarding the relation of opticians to the medical profession reported, through Dr. Norton, the Chairman, the following resolutions which were adopted without debate.

Resolved, That it is the opinion of the American Homœopathic Ophthalmological, Otological, and Laryngological Society that opticians are not qualified either by education or training to perform the work of the oculist which deals with the function of the eye and the health of the patient.

Resolved, That until opticians have fitted themselves by a medical degree to treat disease, all physicians are reminded of the danger to their patients in consulting tradesmen and are requested to discountenance the growing pretences and assurance of the opticians.

Dr. Norton then moved that the resolutions just adopted be referred to the American Institute and to other societies throughout the country for action. Carried.

The President: The report of the Auditing Committee, is now in order. No member of the committee was then present, but later the committee reported that the Treasurer's accounts had been examined and found correct, and the report was accepted by the society.

Dr. T. L. Shearer, the Chairman, then read the report of the committee upon the President's address.

The committee appointed to report upon the President's address

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were greatly impressed not only by the able way in which his views were placed before the society, but also by the tremendous import to future generations if his suggestions are carried out in a practical manner. Human beings as a class are not observant, although very curious by nature about things that are novel. Why should parents, who have naturally no reason to be on the watch for diseased conditions involving the organs of the special senses, when they have not even heard of such possibilities, be expected to care intelligently for their children? And yet, in the address, this is the point of chief value; for children, as a rule, are not brought to the physician until months, at least, if not years, of valuable time is lost—a time of life when early impressions and normal mental development are dependent upon a healthy state of the special organs. The only way to accomplish this satisfactorily is for the physician to instruct the parents, to warn them of diseased conditions possible in childhood, in order that they may protect the interests of their offspring. The committee feel that this is a subject which deserves widespread attention, and, therefore, recommend that the address be published in reprint form for distribution among the members of the American Institute of Homœopathy during the coming year.

THOMAS L. SHEARER,
P. C. MORIARTY,
IRVING TOWNSEND,
Committee.

The report was adopted without debate.

The report of the Board of Censors was then presented by Dr. E. B. Hooker.

There have been referred to the Board of Censors fifteen applications for membership. These applications come from gentlemen, who, for the most part, are unknown to us, and they are not recommended by anyone, as it has not been required; therefore we have had to take them largely on faith. I think there is no doubt but that they are all ladies and gentlemen whom we wish to haveas members. In the absence of further information, if they come from a straight, reputable college, we have simply passed them. I say this in explanation, because we do not stand personally responsible for these applicants. We, therefore, recommend all the following applicants for membership:

Charles C. Boyle, M.D., 49 W. 37th st., New York.

Herbert A. Church, M.D., 601 S. Warren st., Syracuse, N. Y.

Charles Deady, M.D., 110 W. 48th st., New York.

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Neidhard H. Houghton, M.D., 867 Boylston st., Boston, Mass.
Charles H. Hubbard, M.D., 8th and Madison sts., Chester, Pa.
Edward Humphries, M.D., Somerton, Philadelphia, Pa.
Ella G. Hunt, M.D., 608 W. 8th st., Cincinnati, Ohio.
Gilbert J. Palen, M.D., 6043 Germantown ave., Philadelphia, Pa.
Thomas Parsons, M.D., 33 S. Clinton st., Rochester, N. Y.
Isaac G. Shallcross, M.D., 1617 Arch st., Philadelphia, Pa.
Zuber N. Short, M.D., 428 Central ave., Hot Springs, Ark.
Richard K. Valentine, M.D., 190 Lincoln place, Brooklyn, N. Y.
Frank P. Warner, M.D., 304 Main st., Canandaigua, N. Y.
Harry S. Weaver, M.D., 1621 Chestnut st., Philadelphia, Pa.
David W. Wells, M.D., 391 Boylston st., Boston, Mass.

These were elected by the Secretary casting a ballot for all the applicants.

Dr. Hooker: In accordance with our by-laws we have the privilege of electing to honorary membership any lady or gentleman whom we think fit for such honor, who has been recommended by the Board of Censors. We recommend the election to honorary membership of a gentleman well known to us all—known throughout the country—a gentleman, who, by character, by attainment, by long years of service, merits the position of honorary membership in our society, and I take great pleasure in nominating for that position the gentleman whom we had the pleasure of listening to yesterday, Dr. Henry C. Houghton of New York.

The question being asked whether the doctor was not now a member, being an ex-president of the society, the Secretary stated that his name had not appeared among the members since the reorganization, as he had not taken any steps to comply with the requirements.

Dr. Moffat: Would honorary membership debar him from service upon committees?

The Chair stated that honorary members had all the privileges of active members except voting and eligibility to office, and that they were exempt from dues.

Dr. Houghton was then unanimously elected an honorary member.

Dr. W. R. King, Secretary of the nominating committee, then reported the following nominees for officers for the coming year:

President, Dr. Howard P. Bellows, Boston, Mass.; First Vice-President, Dr. C. J. Swan, Chicago, Ill.; Second Vice-President, Dr. E. L. Mann, St. Paul, Minn.; Secretary, Dr. Herbert D. Schenck, Brooklyn, N. Y.; Treasurer, Dr. Charles H. Helfrich, New York;

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Censors, Drs. J. H. Harvey, Toledo, Ohio; G. H. Quay, Cleveland, Ohio; P. C. Moriarty, Omaha, Neb.; C. L. Rumsey, Baltimore, Md.; O. L. Smith, Chicago, Ill.

On motion of Dr. Norton, Dr. King was instructed to cast a ballot for all these nominees, which he did, and they were declared elected as officers for the ensuing year.

Dr. Bellows was then called upon and said:

"Mr. President and Members of the Society:

"I am deeply sensible of the honor which you have conferred upon me in choosing me for this office. I am afraid you have overrated my ability to fill such a position, and I know that I do not deserve it as much as other members among you, by reason of their age or their service in a wider field of work than my own. It only remains for me, however, to attempt to deserve your confidence in a most faithful effort to discharge the duties of the office. I thank you from my heart for the chance which you have given me to serve."

The remainder of the morning hour was occupied with the reading and discussion of six papers.

At 12.40 an adjournment was taken to 2 P.M.

Second Day.—Afternoon Session.

The meeting was called to order by the President at 2.15 P.M., and the Secretary presented a report from the Censors recommending for membership George S. Wells, M.D., Wells Block, Sistersville, W. Va., and John Storer, M.D., 1007 Columbus Memorial Bldg., Chicago, Ill. The Secretary was instructed to cast a ballot for these applicants, who were declared duly elected to membership.

During this session ten papers were read and discussed.

The Secretary then moved that all papers that had not been read be considered as having been read by title, and be referred to the Executive Committee for publication in the Transactions. Carried.

Dr. J. B. Garrison moved that a vote of thanks be extended to Joseph H. Borton, proprietor of the Hotel Dennis, for his courtesy in extending to the society the use of his Music Hall for our meetings, a room for the display of the exhibits, and for furnishing so generously electricity for the use of exhibitors, and that the Secretary be instructed to inform him of this action of the society. Carried.

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Dr. F. D. Bates, Chairman of the Committee on Attendance, reported the following attendance at each session:

	Members.	Visitors.	Total.
June 19, morning session	35	28	63
June 19, afternoon session	46	32	78
June 19, evening session	54	48	102
June 20, morning session	59	107	166
June 20, afternoon session	58	7	65

The report was accepted, and the committee discharged with thanks.

Before adjoining the society the President said:

"Before declaring this twelfth annual meeting of the society closed, I wish to express to you my appreciation of the honor you have conferred upon me by electing me to this office, and to thank you most sincerely for the assistance rendered not only during this session, but through all the months of preparation for this meeting.

"I wish to extend my thanks to the Secretary for his valuable, efficient aid, to the other officers and members of committees for their untiring efforts, to the authors of papers and their disputants for their thoughtful preparation, to each and every member of the society who has contributed to the success of this meeting: for it is due to the co-operation of the many, rather than to any individual, that this our twelfth annual meeting has come so auspiciously to an end. I now declare the twelfth annual meeting of the American Homœopathic Ophthalmological, Otological and Laryngological Society closed.

The adjournment was taken at 4:55 P.M.

HERBERT D. SCHENCK, M.D.,
Secretary.

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OUR SPECIALTIES AS RELATED TO MENTAL DEVELOPMENT AND MODERN EDUCATIONAL METHODS—PRESIDENT'S ANNUAL ADDRESS.

By Elmer J. Bissell, M.D.,
Rochester, N. Y.

MEMBERS of the Society and Friends: We as physicians specially engaged in studying and treating the eye, the ear, the nose and the throat, seats of four of the five special senses, hold an important and most unique position, not only among physicians, but among psychologists and educators. Dealing as we do so exclusively, and under such varied conditions with the most essential means by which the human organism may know what is external to it, we should be students of, and contributors to, the domain of physiological psychology. The very knowledge and experience which we possess regarding these special organs of sense, so necessary in acquiring an education, places a responsibility upon us in matters pertaining to the education of the young, and should enable us to speak authoritatively on pedagogic methods as influencing the mental and physical health of students.

I have, therefore, selected as the theme of this brief address "Our Specialties as related to Mental Development and Modern Educational Methods."

Through the four avenues of sense which are within the field of our work, sensations from the outer world pass to the brain cells, and that marvelous something we call the mind is aided in its development. The cognative mind is therefore quite largely the elaborated, accumulated information gathered by the senses. These sense perceptions form the basis for, and naturally precede the higher mental operations of logical thought, reason and imagination. Consequently this sense material should be transmitted to the brain accurately, and without an undue expenditure of nerve force.

It is a matter of common observation that the interdependence of the physical and mental life is intimate and intricate. Bodily fatigue, ill health, malformed or diseased eyes or ears, obstructed nasal respiration, lessen intellectual power and contribute to mental dulness. On the other hand, prolonged and severe mental work, overstimulation of

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the brain, especially in the growing child, and the expenditure of excessive nerve force at the brain centers devoted to the reception and storing of impressions received by the special organs of sense mean not only lessened mental efficiency and brain fatigue, but a general impairment of nutrition and a disturbance in the normal functional activity of some, or even all, of the organs of the body. Nerve force is as truly something to be reckoned with as gravitation, although both are subtle in character and hard of satisfactory definition. The former is almost as definite in its limitations and mode of operation as the latter.

Nerve force is expended in every act, every thought, and the amount at the command of any individual is relatively fixed, and any overdraft must be settled for in full, and usually with interest. With these general statements of facts before us, and which time will not permit of further elaboration, let us now more closely analyze the intimate relationship between the special organs we treat and the development and operation of the intellectual faculties.

If specialism necessarily imposes a certain narrowness of thought, yet within the domain of our specialty we should be broad and ever ready to carefully consider anything which is vitally related to it. Such a vital relationship exists between our work and the intellectual life, for we are dealing with means necessary to the attainment of great ends. Concurrent with physical development there is supposedly increased mental power. This mind development is from the simple to the complex, from the mere reception of material by the senses to the inner and higher impression, as expressed in thought, feeling and imagination. No period of life is entirely given up to any one form of mental development, for we are ever moving further and further from the life of the senses. Up to ten or twelve years of age both the emotional and cognative minds are largely receiving and differentiating sense impressions. This then is the period when our opportunities are greatest for far-reaching results. Not a physician present but what is consulted almost daily by patients in middle life with conditions long uncorrected, which, if relieved earlier, would possibly have changed the whole character of their lives.

As the mind influences the states of the body, and the mind is influenced unfavorably by abnormalities of the organs of sense, and the mind expresses itself in feeling as well as in knowing, therefore is it anything less than a statement of fact to say, that such patients might have been healthier? Yes, but also happier and wiser. Have we kept clearly before us this threefold effect of our work? It is good to

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have made our patients healthier. Is it not of greater or equal importance to have made them happier and wiser? Man is mind, not body. The fact that we by our skill influence the feelings, emotions, imagination and intellectual power of our patients, gives added dignity and importance to our efforts. If we accept these facts in psychology, it is a matter of no small moment that a patient comes to us irritable, or cross, or melancholy, or ambitionless, or forgetful, or intellectually dull, for we may possess the skill to so transform these abnormal mental states that life, that which is more than body, that which is eternal, is worth living.

If these far-reaching effects may most surely be secured by correcting abnormalities of the eye, ear, nose or throat early in life, should the beneficent results be limited to the comparatively few children who come professionally under our care? This suggests the broader relationship of my subject to educational work.

If we could but accurately know the number of children with impaired sense organs who are counted as forgetful and stupid, scolded because they are restless and inattentive, and actually punished because they are nervous and irritable, we who have had extended opportunities for observation would be startled and keenly aroused to our duty. We are citizens as well as physicians, and owe something to society. Knowledge of such a vital and practical character imposes a responsibility which I trust none of us are anxious to escape. How, then, can these truths be best brought to the attention of the thousands going through life fighting against unnecessary odds? The practical solution is through the teachers of our land. They by their intelligence, opportunities and interests are best qualified to extend this knowledge to those most in need of it, the children and youth of our schools. Some teachers have already grasped the relationship between abnormal sense organs and impaired mental activity, and are ever zealous in searching out those pupils who are laboring at a disadvantage from this cause. However, there are many directly and indirectly engaged in educational work who do not understand or appreciate the beneficent and threefold effect which may follow the correction of such abnormalities. To such teachers, normal classes and boards of education we should direct our attention, and as opportunity is offered, point out to them in a clear, practical, yet scientific manner, the importance of giving careful thought to the relationship which exists between the organs of sense and mental development. The need of educating the educators of our land upon this subject is so great that it would not be beyond the bounds

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of propriety to even ask for the privilege of addressing educational societies anl teachers' associations upon this theme. Such efforts, intelligently directed, may favorably change the life history of many individuals. This work then is worthy of the earnest and thoughtful endeavor of every member of this Society.

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INFLATION.

By Sayer Hasbrouck, M.D.,
Providence, R. I.

WERE the question asked, What do you consider the so-called cornerstone of aural treatment, it is safe to say that the answer would be inflation.

On the other hand, how many who daily use this method could give a clear explanation of the reasons for so doing or the results to be expected. It is true that the student of to-day is being better trained in the theory and practice and theoretically has a better understanding of the fundamental principles of practice, but for many years to come the student of the past will be in the active field and, if he wishes to keep abreast of the times, must work on more scientific principles. Much of his experience was acquired by the rule of thumb which in its day seemed adequate for all demands.

The old methods of inflation no doubt did more good than harm although many times harm was done or little good accomplished—both unnecessary with a clear understanding of the possibilities and limits of the methods used. Inflation has its sphere and its limits and these should be thoroughly understood by every one who pretends to its use.

It is not my intention to go into the details of this subject as this is fully treated of in the text-books of aural disease. At the same time I desire to protest against the too frequently careless use of this valuable means of treatment. Especially should one be more careful in placing it in the hands of our patients for self-inflation. Too frequently the patient who has been instructed in the use of a Politzer bag believes that he has at his command all that is necessary for the treatment of aural disease thereby neglecting other and essential methods of treatment which, if given in time, might have accomplished the desired result, and too late he is forced to realize that his efforts have been in vain and the time for successful treatment has passed.

Inflation as first practiced was for the purpose of opening the Eustachian tube by direct application of compressed air through a hollow tube now known as a catheter. Later this end was gained by a more general inflation by the method known as Politzer's, where both

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ears were inflated at the same time, compressed air being the means used. This was further supplemented by an attempt not only to open the passage but at the same time, by means of a volatile medicament, to directly treat the tissues themselves. This was a great advance in the treatment of aural disease but still more was desired and, with the adoption of nebulized fluids, another and more valuable method was added. With a better understanding of drugs to be used and the methods of application I believe great good may be expected.

There are two objects for which inflation is intended—the first, diagnosis, and the second, treatment.

For the purpose of diagnosis the catheter is to be preferred although much in this way may be learned by means of Politzer's and Valsalva's methods. The latter is especially useful if we desire to make a personal inspection of the drumhead at the time of inflation.

Of the relative values of the different methods of treatment much may be said and each has its advocates. The method of Valsalva as usually practiced is rarely advocated on account of the attending congestion of the cerebral vessels that it occasions and the liability of harm following its too frequent use by over-distention and subsequent relaxation of the membrana tympani. This last objection is easily overcome by a simple method that seems little known. It was suggested by Dr. Houghton in a short paper before the New York Homœopathic Medical Society in 1887, at which I was present. He directs the patient to close the external meatus with the middle finger of each hand and at the same time closing the anterior nares with the thumbs, then exhaling as usual. I have at times suggested this method to those recovering from acute catarrh of the middle ear to the great comfort of the patient, and I have explained its importance to those patients who have been using this method in the old way, but all such cases should be cautioned against its too frequent use.

In speaking of the relative value of the catheter and Politzer's method much can be said but to my mind neither should be discarded for the other as both have their places and at times one is preferable to the other. Politzer's method should always be used in children and in acute diseases as the passages are more easily made patent and there is less liability to injury where the tissues are acutely inflamed.

In the case of children inflation can be more easily performed by means of a piece of rubber tubing much like a diagnostic tube with a mouth piece on one end to be inserted in the surgeon's mouth and another suitable tip on the other end for the child's nose. Inflation is

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accomplished by forcible expiration on the part of the surgeon. It is obvious that this should not be attempted by a person suffering from a disease of the air passages.

A similar arrangement has been recommended by Dr. Dundas Grant for auto-inflation, the mouth-piece being inserted in the mouth of the patient, when by forcible expiration the vault of the pharynx is closed and air is forced into the Eustachian tubes by means of a dilated nose piece in which cotton, medicated with a volatile medicine, can be placed. The added effect of the vapor is gained by this means.

I have also a bent glass tube that is intended for the same purpose.

The catheter, in all cases of long standing where adhesions exist, is the most serviceable though its use may be supplemented usually by Politzerization to advantage.

Last year at a meeting of this Society, in a paper on the use of nebulized fluids, I described what I saw fit to call a modified method of Politzerization. This is accomplished by the use of a nebulizing apparatus under compressed air, the pressure of which is under the control of a regulator, as in acute cases much judgment should be used as to the pressure needed. It is evident that much force will be lost in passing the air through the oily fluids used. To obviate this and to obtain known pressure, I have tapped the air-supply previous to its entering the nebulizer and again joined the two before using it for inflation. This method of inflation not only opens the air-passages but at the same time suffuses the tissues with such medicaments as we desire. A full description of this method with an illustration of the apparatus can be found in the Transactions of this Society and also in the October, 1898, number of the HOMŒOPATHIC EYE, EAR AND THROAT JOURNAL.

I supplement this treatment in the hands of the patient by means of the aseptic hydrocarboline atomizer made by George C. Frye. It is the cheapest and most convenient hand atomizer I know of and, what is more, does not get out of repair. After a little practice the patient is able to use it for Politzerization as well as the nebulization of fluids.

In the use of the catheter great care should be taken not only for the comfort of the patient and that no harm is done. In sensitive cases cocaine applied on cotton to the nasal passages facilitates matters. Since using suprarenal extract in my practice I have found it of great assistance in making the proper examination of the nasal cavity and also in passing the catheter. Its use bids fair to be a boon second only to cocaine in operative work about the nose, and I am not sure but that

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its therapeutic field will embrace many diseases of the eye, ear, nose and throat.

Previous to the passage of the catheter the nasal passages should be inspected and, if necessary, cleansed, points of obstruction noted, and the catheter passed by the aid of reflected light if necessary also, the patient at the same time being directed to breathe through the mouth, as this keeps the soft palate as far as possible out of the way. The orifice of the Eustachian tube being found, a gentle current of air should be used and its effect noted by means of the diagnostic tube. If the passage is found patent, you may continue the inflation, using a nebulized current if necessary, but never under too great pressure, as where this is necessary it is doubtful if any permanent good can be accomplished and the liability of harm is greatly increased. Death is said to have been caused by this. At times an alarming emphysema in the surrounding tissues occurs. I have met with this accident two or three times but have never seen any harm follow. I have had hæmorrhage of the middle ear occur once and have known of its occurring in two other cases. It is indicated by quite acute pain and inspection of the drumhead plainly shows a dark fluid mass behind it, and in my case I could plainly see the middle ear slowly fill. The pain lasts some twenty-four hours, but absorption took place in a few days without further discomfort. This accident is illustrated and described in the De Schweinitz-Randall "American Text-Book on Diseases of the Eye, Ear, Nose and Throat" just issued. I once ruptured the membrana tympani while using Politzer's bag, the patient being an old gentleman, but as it evacuated some pent up fluid in the middle ear there was a marked improvement of the hearing.

During the past winter I accidentally stumbled upon an interesting and, what seems to me, a valuable aid to the more satisfactory inflation with the catheter of many if not all cases. While inflating an old gentleman whose ears I had never been able to satisfactorily inflate I was greatly surprised to note that the air was passing freely and, on looking at the patient, I noticed that his mouth was widely open. On mentioning to him that at last we had succeeded in opening the tube he closed his mouth and I was again surprised to find the current of air was cut off. I asked him to again open his mouth widely and the air passed as freely as before. I have repeated this observation many times since then with equal satisfaction, especially in cases of relaxed mucous membrane where no doubt we push some of the membrane in front of the mouth of the catheter thus obstructing it.

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In many cases where I have no difficulty in passing air into the passage it has not seemed to materially assist matters, but in many others it has been of great assistance. There is no doubt that opening the mouth widely has a tendency to contract the tensor palati mollis muscle whose action opens the Eustachian tube. We have all had frequent demonstrations of this as we note how the air rushes into the middle ear during the act of yawning.

In this day of aural massage, with its multiplicity of mechanical appliances for its accomplishment it is well to remember that they can accomplish but little of permanent value unless the Eustachian tube is patent and, when patent, massage of the membrana tympani can be most satisfactorily accomplished by an appliance that interrupts the air current from our compressed air apparatus, either by means of the Eustachian catheter or by my so-called modified Politzer's method of inflation aided by external atmospheric pressure, causing the membrana tympani to move from within out and without in at the same time that we are applying our nebulized fluid.

DISCUSSION.

Dr. Gustave A. Mueller: Inflation is of such every day importance to the otologist and is a diagnostic and therapeutic agent so often employed that scarcely too much can be said on the subject. The essayist, however, has treated the subject so thoroughly that little can be added that will shed much light on the matter. He says that "Inflation is practically the corner-stone in the treatment of aural disease." And this is true for very logical reasons. Unfortunately the cases in which inflation is markedly the means by which to effect a cure come into the otologist's care so late that it is only after long continued and persistent treatment that it is possible to bring about relief and then frequently, only too frequently, but partial relief.

I will say nothing of the relative value of the various methods employed, as each has its own sphere of employment, and even in each sphere the skill acquired by different operators in following different methods must influence the individual operator. I believe that fully ninety-five per cent. of all the cases of defective hearing with all their attendant train of local manifestations, such as the retraction of the drum, perforation of the drum, thickening of the drum, otorrhœas, mastoid involvement, &c., could be avoided if an intelligent care were given at the proper time to naso-pharyngeal growths and diseases which have a tendency to irritate and assist in bringing about a catarrhal condition of the Eustachian tubes, in this way interfering with the natural inflation of the tubes and thus destroying the equality of the atmospheric pressure within and without the drum. If in the beginning of these troubles the irritating cause be removed and the

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patency of the Eustachian tubes be maintained by inflation I believe we can avoid in most cases the hyperplastic conditions, stenoses, &c., which are usually the forerunners of middle ear disease. The affections coming within the otologist's domain have been in the past the most difficult in which to bring about satisfactory results. The delicate, intricate anatomy of the parts has made us fearful at times, but in these later days I believe we are arriving at a better knowledge of ways and means of reaching them. The inflation of the Eustachian tubes with air saturated with medicaments opens a wide field for research and observation and I believe the immediate future is pregnant with discoveries along this line, which will make the coming decade an important era in the treatment of aural disease. The essayist has mentioned an experience which I am able to verify by several experiences of a like nature in my own practice. In several cases, where I found it impossible to properly inflate the tube through the catheter, although it seemed to be in proper position, on directing the patient to open the mouth the obstruction, whatever it might be, seemed to be removed, and there was no further bar to the admission of air. My attention was first called to this little point by Prof. Schech of Munich. In other cases where the tube seemed to be occluded by tough tenacious mucus it was impossible to inflate properly until I had passed an Eustachian bougie, and so to a degree cleared the way. With regard to the method of inflation in the case of children by making forcible expiration through a rubber tube on the part of the operator, I must confess I cannot agree. The idea of using the breath for any such purpose is obnoxious to me, or rather would be, were I the patient. I have found but little difficulty in bringing about the desired result by the use of the Politzer bag. Almost invariably children cry, and the very act of crying raises the soft palate and closes the pharyngeal vault in the same way that the act of swallowing does. So far as the danger of rupturing the drum is concerned, in adults. I believe the danger is much overestimated. Personally I am in the habit of using a fourteen-ounce Politzer bag, and, as I have a strong right hand, am able to use considerable force, but I have yet to see any unfavorable result. Our individual experiences are our best teachers, however, and there is an acquired, as well as an intuitive knowledge, of the amount of pressure to exert, which cannot be taught in words.

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A BURN OF THE CORNEA.

By John L. Moffat, M.D.,
New York (Brooklyn).

MISS E., an intelligent girl fifteen years old, dropped a hot curling iron upon her open left eye (the face was upturned) at about two P.M. on Sunday.

Her father, a physician, at once instilled cocaine and atropine, gave *Aconite* 3c hourly, applied heat locally and telephoned me; I ordered the heat changed to an ice bag and called two and a half hours later. At that time I saw just below the visual axis a horizontal superficial wrinkled white eschar two millimeters wide extending six millimeters across the cornea. The pupil was well dilated, there was ciliary injection, pain, and some redness of the lids and cheek that had been caused by the hot applications.

I ordered the *Aconite* continued, instillations—whenever the pain should recur of a 0.25 per cent. solution of holocain hydrochlorate and iced linen cloths which were to be changed as soon as they ceased to feel cold. These directions were faithfully carried out, the cloths being changed about every half-minute except from one to 6 A.M., and the holocain instilled a number of times.

The next afternoon, twenty-four hours after the accident, I found the patient lying comfortably in bed with an iced cloth upon the eye. To my astonishment a careful examination could detect no evidence of the accident, beyond the mydriasis and pinkish coloration (externally) of the lid! Five days later the ophthalmoscope revealed hyperæmia of the disk; otherwise the eye was normal except for the mydriasis.

Was the eye really burned? Yes. It was evidently a slight superficial burn causing white swelling of the anterior epithelia. The prompt re-establishment of their normal condition was doubtless due principally to the early and continuous application of the cold cloths, but I doubt if this would have been so effectual without the *Aconite*.

For such prolonged treatment iced cloths are safer than the ice bag, and holocain less dangerous than cocaine.

Did the holocain have any but its anodyne effect? Would the cure have been as prompt and complete under cocaine, even granting immunity from systemic poisoning by it?

Although holocain smarts more than cocaine it does not desiccate the cornea, and I believe this desiccating action of cocaine would have tended to lower the vitality of the anterior epithelial cells hindering rather than helping the *reëstablishment* of their normal condition.

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DISCUSSION.

Dr. H. B. Ware: It seems to me that Dr. Moffat prescribed a correct treatment in this individual case, as is proven by the remarkably quick recovery; but as I am to discuss this paper, I must look at the treatment in a general way in the abstract.

I cannot question the propriety of the ice water applications when he first saw his case; but I should have used some antiseptic in the water, such as boric acid, preferably. As to anything else dropped into the eye, I should have had it sterilized first. He used holocain. This drug is not capable of being treated to the sterilizing point and retain its anæsthetic properties, as eucain and cocain can be treated. I agree that holocain is less dangerous to a corneal abrasement than is cocaine, when neither is sterilized, for the latter seems to retard granulations, especially when the deeper structures are involved. In this case, if the pain was not relieved by the ice applications, I should have used a eucaine solution first having had it thoroughly sterilized; but I think I would have used a mild opiate before any local anæsthetic. I should be induced to think the ciliary injection and hyperæmic disc were due more to the mydriasis rather than the injury.

In regard to the questions as to whether holocain had any but an anodyne effect, I should say no, as no healing properties are accorded to it. The question as to whether the cure would have been as prompt had cocaine been used, I have already answered. But why, in such a case, is it necessary to choose between two evils, for a superficial burn will heal almost of itself without any treatment when the congestion of the blood is controlled by the early use of ice applications. A burn from lime, which often happens to plasterers, must be treated differently. Oils should be used, such as castor oil or linseed oil, but these should always be borated, and never use cocain or holocain. Sterilized eucaine I have used with no bad after effects in these cases. I will state here that it has been my observation that even eye men are at times careless in making thorough examination of the eyes of plasterers when burned from lime. They find a burn on the cornea and treat that without looking further. In two cases I have found a symblepharon which should never have been allowed to occur, owing to their location, had proper care been exercised by the oculist in his examination at the time of the injury.

Dr. B. W. James: I am not surprised at the action of this case in healing so promptly; because, as we know, the application of thermo-cautery to some of these ulcerations of the cornea rather stimulates the growth, or, at least, the repair of that structure. I have seen the red hot, or intensely hot, thermo-cautery swept across with beneficial results and the ulcer has healed very promptly under this treatment. I do not doubt that many of the members here have adopted such a plan.

Dr. Chas. Deady: About ten years ago, in my clinic in the New York Ophthalmic Hospital, I had a case in which hot lead had been

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dropped into an eye. The entire cornea was covered with one large eschar. It looked bal for the patient. In trying to do something to save some vision, I put him on the operating table, and very carefully cleaned off the eschar until the cornea was clear over its entire surface. That man was discharged in a week with an entirely clear cornea. I have a case in the hospital now, with a burn from a hot coal which stayed in contact with the eye longer than the lead did, in which I followed the same treatment, with nearly as good a result, although in one place the burn was too deep to get a perfect result. The first case was absolutely perfect, and I was very much astonished as I had never treated a case similarly before. The treatment was like Dr. Moffat's: iced cloths, and *Aconite,* but I did not use holocaine.

Dr. Geo. W. McDowell: Nearly five years ago I had two cases occurring within a month of each other in the left eye, in which the cornea had been burned by a curling iron. In one the entire surface of the cornea had been scorched so that it looked like a case of interstitial keratitis. In both cases healing was very prompt and the cornea became entirely clear in three days, cocaine being used to relieve pain, and *Aconite* given in both cases. The eye was bandaged afterwards and atropine was instilled to prevent possible trouble in the iris. I think the burns of the cornea need no antiseptics, as Doctor James has pointed out, the cautery being itself an antiseptic, and hence we need no antiseptic solutions, which rather interfere with the healing of cases of this kind than otherwise. The superficial layer of the cornea sloughed off in about twenty-four to forty-eight hours in my cases.

Dr. Sayer Hasbrouck: I have had a unique experience in the curling-iron business. I have seen the cornea burned I don't know how many times by ladies themselves, and had it always heal with the same result as Dr. Moffat, showing that evidently the iron did not remain in contact very long with the surface. Two years ago I saw a case where a curling iron was used by a nurse upon a child, and in some way she burned the child's cornea. That was a very different condition of affairs. There we had severe ulceration for some three weeks, showing that though she pulled the iron away very quickly from her own eye, yet, when she had touched it on someone's else eye, it might do serious damage. In other words, the eye is safe in the hands of the patient, but if in the hands of the second party, you are liable to do just as much damage with the curling iron as any other application of heat.

Dr. F. H. Boynton: Something should be said of the influence of ice on the healing process. Superficial burns of the cornea yield promptly whether you put on ice or not. The eschar remaining depends upon the depth of the burn—how deep the tissue is involved. It would not be safe, in my opinion, for the impression to prevail that ice is a good thing to apply to the cornea. Our experience at the hospital (I think Dr. Deady and the other gentlemen present will bear me out) for several years has taught us to give up the use of ice as

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soon as an ulcer forms in the course of disease of the cornea. These superficial wounds heal well with ice. That agent will heal traumatisms from many causes.

Dr. Chas. Deady: Ice does more than relieve pain. The reaction from a burn of the cornea is often very great. If you prevent that reaction with ice, I think you help and hasten your case. If you do not use anything, the reaction in my opinion is often a great deal more than if you use the ice.

Dr. John L. Moffat: Of course it was my duty to dilate the pupil; atropin was the best mydriatic under such circumstances, although I wanted to give *Aconite* internally. Whether either would have acted better had I not given the other cannot be said, probably the action of the atropin was practically local and the *Aconite* mainly constitutional.

What impressed me was the prompt recovery after so threatening an aspect. I have not tried to sterilize holocain; have used it for cataract extraction and foreign bodies, but prefer eucain B except for the latter when I do not mind its irritation.

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THE MICRO-BIOSCOPE FOR THE MINUTE STUDY OF LIVING STRUCTURES.

By F. Park Lewis, M.D.,
Buffalo, N. Y.

ONE of the most profound of our modern scientists has said that to see the dead tissue under the microscope is to see the fireworks the day after the show. The energy which has actuated the thing and made it what it was has gone—and what is left is simply the empty shell. There has been a growing feeling, therefore, that, if the obscure problems in the life history of living structures are to approach solution, these structures must be studied while they yet live. Hence it is that biological research has progressed even more rapidly than microscopy and while making use of the latter has not been wholly dependent upon it for its most important conclusions. It has been apparent, therefore, that if an instrument could be devised by which an insight might be got into Nature's laboratory while she was at work—if she might be caught, so to speak, in *flagrante delicto*—that she might be led to betray some of the secrets which up to the present time she has so carefully guarded. Her most vulnerable point seemed to be the eye, one of the most vigilant sentinels of the nervous citadel; so sensitive that the intangible light rays will cause the normal pupil to respond with the delicacy and certainty of a finely attuned instrument and probably more delicate and more responsive under the best conditions than the most accurate artificial instrument ever made. If, then, it were possible to observe this mimosa plant as Thoreau is said to have seen Nature, as with the eye of a microscope, what possibilities of biologic function might not be opened up to the inquiring mind and the observing eye? What are the differences in the result when the eye is stimulated by the lower red and the upper violet of the spectrum? What, is the effect upon this sensitive instrument of the ten or a dozen octaves of invisible light far up in the actinic field, beyond that recognized by conscious perception, or down through the caloric rays that bolometric measurements have shown to exist in the infra-red portion of the color field?

It is unnecessary to take the time of this Society to outline the

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multitude of fascinating problems that obtrude themselves for solution, but the impelling desire to know more made necessary an instrument by which more could be seen. Many atempts to secure such an instrument were met by failure, until the problem was presented to H. L. De Zeng, Jr., to whose broad knowledge of optics together with his skill and ingenuity I am indebted for this instrument. To Mr. De Zeng a like problem had suggested itself and he had already constructed some instruments which might be readily applied to this kind of investigation. The demands to be met were a compound microscope with suitably balanced lens systems, the objective being of sufficiently wide angle to give a flat field, and the whole being so placed that it could readily be approached to the tissue to be studied.

With De Zeng's aid these requisites were met and, as a result, I have the pleasure of exhibiting to you what I have designated as the micro-bioscope, an instrument, as the name implies, for the microscopic study of living structures. It consists of a brass tube 10½ inches long, and having a draw tube giving almost double that length when completely extended. It is mounted on a round rod, which may be fixed by a set-screw at any height. It may also be rotated on this rod at any meridian. The rod is attached to the tube by a hinge joint so that any angle or position may be readily obtained. The tube is placed upon a rack-and-pinion adjustment, so that the working distance of the lens system—about 2½ inches, may be quickly covered. While the brass mechanism is exquisitely made—the—correction and adaptation of the lenses is a triumph of optical skill that reflects very great credit upon Buffalo workmanship. I have never seen more beautiful lenses than those employed in this instrument.

The objective is a five-inch achromatic lens corrected for the cornea, iris and interior lens surface. It has an angle or aperture of 35 degrees and this, with a 2½-inch eyepiece gives an amplification with the draw tube in of 20 diameters; with the draw tube out, of 50 diameters, with the one-inch eyepiece which may be used, we get an amplification of 50 diameters, as a minimum, and 125 diameters as a maximum enlargement. Any point between these may, of course, be obtained by extending the tube to a lesser distance.

In the few weeks that I have been using this instrument Ihave had opened to me a wholly new vista in biologic and pathologic study. The groups of vessels surrounding the corneal margin have presented a beauty and an interest never recognized before. It is now possible to follow the new vessels as they make their way in corneal inflamma-

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tion into and through the transparent structures, the study of corneal reflexes will take on a new value since they may be studied in such fineness or detail. But the fascination of the micro-bioscope is in the wonderful view which is obtained of the iris and pupillary margin. This exquisitely sensitive orifice is never quiet—in the normal eye. It is tremulously feeling for the stimuli by which it is affected. The effect of the fluttering of an unsteady light may be watched in the responsive action of the swelling and contracting pupil. A mental start, a sudden word, shows its effect under the micro-bioscope.

I shall not attempt to outline here its possible range of usefulness, as this is merely a sketch of the instrument and any elaboration is out of place, but I wish to say that its possibilities in the investigation of life problems grow upon one as the beautiful pictures are brought in view, and I shall be surprised if the micro-bioscope does not prove a valuable aid to the student in many lines of scientific research.

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BLOOD POISONING IN A CASE OF EMPYÆMIA OF THE ANTRUM FOLLOWING ACUTE MIDDLE EAR CATARRH —RECOVERY ON THE USE OF LACHESIS.

By Leigh Y. Baker, M.D.,
Washington, D. C.

WHILE cases of antral empyæma of a chronic nature are frequently met with in both medical and dental practice, the acute form is less often noted, but when seen, the cause of the trouble can generally be easily referred either to carious teeth or to extension of post-nasal trouble; the former being by far the more frequent cause of both the acute and the chronic form.

In reviewing this subject, I could not find recorded a single case where middle-ear catarrh was even suspected as being an ætiological factor, nor can I find a case of empyæma where *Lachesis* was either used or suggested as a remedy, so that on both points this case seems to stand alone, and this being so I can cite no cases in reference.

Under Zuckerkandl and Hajek of Vienna, one is taught that the first procedure in the treatment of this condition is to obtain drainage by going through the wall of the nostril or by tapping the antrum through the socket of an extracted molar or bicuspid, and possibly this is the only rational course to pursue; in fact, I had determined upon this procedure, when, to my great surprise, and I may say, satisfaction, my case showed signs of improvement, so that the idea of operation was first postponed and then abandoned.

Case.—On Nov. 10th I was called to see a case of "earache" in a girl of about ten years who was anæmic and poorly nourished. I found considerable pain in both ears but more marked in the right. The discharge, which was more profuse from the left ear consisted of a thin, yellowish fluid, excoriating, and with very little odor.

There was a history of chronic otorrhœa, and the parents did not comprehend the gravity of the condition for I had only been called on account of the pain. I learned that the discharge had been present for some days before I saw the patient.

I cleaned the canals with dry cotton and found perforations of both drums, the larger being of the left. There was not as much evidence of inflammation as I had expected to find, and although the pain had been great during the night, it had diminished to a considerable extent, and there was very little at the time of my visit. I gave *Capsicum* 3x and *Pulsatilla* 3x every half hour.

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On the next day, Nov. 11th, the pain had been much less and there had been no discharge from the right ear, while that from the left was markedly less. I repacked the external canals with calendulated boracic acid and continued *Capsicum* and *Pulsatilla* as before.

Nov. 12th.—No discharge from the right ear; had had a good night until early in the morning when she was awakened by a darting and throbbing pain in the right side of the face which had increased in intensity as the time passed. Gave *Aconite* 3x and *Hepar sulph.* 6x.

Nov. 13th.—The pain had increased and was then intense. The right side of the face was swollen and flushed while the left side was of a peculiar, waxy appearance. She could not open the mouth very widely, and such examination of the tongue as could be made showed it to be swollen, dry and brown. There was a discharge of a yellowish semi-fluid substance from the right nostril when the patient sat up in bed, which, in fact was the only comfortable posture she could assume. I redressed the ears and gave *Belladonna* 3x *Hepar* 6x.

Nov. 14th.—The infiltration of the tissues had increased, but the pain was somwhat less and the patient was much more comfortable. Discharge from the nostril still profuse and had changed to a mucopurulent character.—Continued *Belladonna* and *Hepar.*

Nov. 15th.—Patient had had a succession of chills with a rise in temperature. Pain was more intense and throbbing. Discharge from nostril had considerably decreased. Teeth separated about a quarter of an inch and jaw could not be moved. The mouth was dry. The face, nose and lips were swollen and blue and the tissues around the right eye were so infiltrated as to nearly close the lids. Gave *Lachesis* 6x one grain every quarter hour and went out to consult with a dentist, leaving with the understanding that if the conditions were not materially improved by the next day, an operation through a tooth socket should be done. In the evening the patient was a little more comfortable and the nasal discharge seemed slightly increased.

Nov. 16th.—The pain was much less and, although the swelling had not diminished, the patient could move the jaw slightly—she was brighter and complained of being hungry, which was the first indication she had given of any appetite whatever. Continued *Lachesis.*

Nov. 17th.—Pain was decreasing and she had passed a fairly comfortable night. Complained of soreness and stiffness of the neck but she could open the mouth better and had more appetite. *Lachesis* continued.

Nov. 18th.—Pain almost entirely absent. Some swelling of cervical glands. Blue color fading but face still considerably swollen. Discharge from nostril continues, but less purulent in character. Stiffness of jaw considerably less, but lips are quire sore. Gave *Mercurius corr.* 6x, *Lachesis* 6x.

Nov. 19th.—All conditions are much improved. Patient expressed a desire to leave the bed and dress. Glands seem normal. Continued *Mercurius corr.* 6x, *Lachesis* 6x.

Nov. 21.—Had a slight chill and temporary rise in temperature

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but local conditions seem improved. Appetite still on the increase, but gave orders to lessen the amount of food given. *Lachesis* 6x.

Nov. 23d.—Swelling of the face rapidly diminishing. Mouth, throat, tongue and nostrils feel and appear in good condition. Both ear drums thickened around perforations but otherwise normal. *Lachesis* 6x.

Nov. 26th.—Patient still improving. *Lachesis* 6x one tablet every four hours.

I continued treatment of the ears and the perforations ultimately healed and hearing became nearly normal. On Dec. 28th I saw the patient. She was in a very good condition, in fact, was in better health than before her illness.

An examination of the teeth revealed no condition which could have incited an attack of pyæmia, they being in a perfectly sound state, and the nares were in a healthy condition both before and after the attack, so that the ear seems to have been the only possible source of infection.

My prescription of *Lachesis* was made principally on the blue color of the tissues, but its good work continued after every *Lachesis* symptom had subsided, and I relied on it to the end of the treatment.

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DESTRUCTIVE DISEASES OF THE NOSE.

By Edward Beecher Hooker, M.D.,
Hartford, Conn.

WHAT I have to say on this subject is so simple and brief that I hesitate to put it on paper and were it not of practical importance, in a class of cases of common occurrence and at the same time difficult to handle in a satisfactory manner, I would not have ventured to lay it before you.

Destructive diseases of the nose are malignant and benign. I have had a very limited experience with cancer of the nose and if I attempted to tell you anything about it I should simply state what I have read in the text-books and as I propose to do nothing of the sort I shall not speak of cancer at all. I have never seen a case of lupus of the interior of the nose, therefore I shall not weary you with an account of something about which I have no original knowledge. This plan of elimination that I am following is a good thing for me, for it lets me out of a lot of second-hand composition, and it's a mighty good thing for you—for you do not have to hear it.

The destructive diseases that I have in mind are atrophic rhinitis and syphilis, the ulceration and bony necrosis of the later stages. All diseases of the nose attended by destruction of tissue have certain features in common, whatever the cause of the disease and whatever the degree of destruction. The turbinated bodies, and the mucous membrane covering all the interior of the nose have several functions, which are, to warm the inspired air, to free it from floating impurities and to render it moist. The upper third of the nose is also endowed with the sense of smell. In order to perform its functions the mucous membrane must itself be soft, pliable and moist. With the loss of membrane, be it only the superficial epithelial layer, such as we find in dry catarrh or in the destruction of syphilitic ulceration, comes loss of function and we have the first important symptom—dryness. Such secretions as there may be are thicker than normal, dust collects on the membrane, scabs or crusts form and adhere and a foul odor follows. This odor may be something really horrible in a case of atrophic rhinitis and the stench from a syphilitic nose in process of caries is beyond description. The secretions them-

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selves are ordinarily but little offensive, but when they are retained beneath the crusts they undergo decomposition and the odor arises. If the formation and retention of crusts can be prevented there will be little or no odor, even in cases of deep ulceration. The problem is then how to keep the nose clean. I believe it to be impossible to restore to normal functional activity to the mucous membrane in advanved atrophic catarrh, but it can be kept clean, odor prevented and a high degree of comfort afforded. The same may be affirmed in regard to syphilitic ulceration. I was led to adopt the method of treatment, about to be described, during the course of a most obstinate and offensive case of syphilitic ulceration and necrosis. I did not at first believe the case was one of syphilis, although the patient was a man of dissolute habits, for I could get no history of an initial lesion or of the ordinary secondary symptoms. There was already partial destruction of the septum and turbinated bodies when he came to me, yet there were certain unusual features which made me suspect cancer. No improvement following the remedies at first administered, I put him on *Potassium iodide*, in medium doses, five grains four times a day, and he soon began to improve. But after awhile he neglected to follow it up and left me for several months. When he came back there was greater destruction. Treatment was resumed for several weeks and improvement again occurred, but for a second time he tired of it and left me for three or four months. Finally the unspeakable odor forced him to return for treatment, with the determination to stick to it until some permanent relief was afforded. His condition was then as follows: the septum was almost wholly gone, a small portion suspended from the roof of the nose alone remaining, all of the turbinated bodies were destroyed and there remained one great reeking nasal cavity, whose surfaces were covered with adherent scabs and crusts, beneath which bloody secretions were festering. The stench was such that no one could live in the same room with him. There were but two ameliorating circumstances—he could smell nothing himself and the nose did not cave in. Every day for weeks I carefully picked off the crusts and cleaned the surface as thoroughly as possible, finishing with generous spraying with bichloride of mercury, formolyptol, or hydrogen dioxide. At home he used a nasal douche of salt water and antiseptic sprays. Internally he took *Potassium iodide.* The condition of the nose improved, but very slowly; the odor was lessened, but still rank, and every day I found the surfaces covered with crusts that had accumulated since the previous treatment. Moreover the crusts adhered so

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firmly that their removal irritated and caused bleeding of the tissues beneath. Powerful sprays had but little effect in cleaning the nose, but were useful for disinfection afterwards. One day on beginning treatment I took an ordinary hard-rubber post-nasal syringe, inserted it into the nasal cavity through the nostrils and forcibly syringed the whole interior of the nose with a pint of 1-2000 bichloride solution, part of the liquid going backwards into the pharynx and escaping through the mouth, the rest of it escaping forwards through the nostrils into the basin which the patient held. When I examined his nose I was surprised—there was hardly a crust to be seen and what little remained was so soft that I easily wiped it off with cotton on probes. The solution had dissolved and washed out practically the entire mass of scabs and crusts, and the tissues were left clean and unirritated. I had the patient get an ordinary hard-rubber syringe and use salt water several times a day, with the result that the crusts ceased to form, the odor became barely perceptible, ulceration ceased, and the interior of the nose became comparatively healthy. For a time I kept up the treatment with the bichloride wash every few days, but the nose was so clean that there was little for me to do, except that the necrosis had destroyed the bone between the nasal cavity and the sphenoidal sinuses and it was necessary for me to wash out this accessory cavity with a long, straight tipped syringe.

Acting on the suggestion derived from this case I began treating all cases in which there was loss of tissue and formation of crusts with the syringe and salt water, with excellent results. Sprays are useful for disinfection, nasal douches will wash clear the floor of the nose, but when there is destruction of tissue (and consequently plenty of room) and formation of crusts high in the nose, the surfaces must be kept clean, to prevent odor and to allow repair, and I know of no means to be compared in simplicity and effectiveness with frequent, persistent, and vigorous use of a syringe and salt water.

DISCUSSION.

Dr. G. M. Haywood: Like Dr. Hooker, I have had no experience with cancer or lupus of the nose; my experience with destructive diseases of the nose being limited to atrophic rhinitis and syphilitic ulceration and necrosis. A case of the latter, which I reported to our State society, was of so interesting a nature that a few of the principal points may be of value. The patient, a man of thirty, had contracted syphilis six years before; his nose had been troubling him a year before he came to me, but he had received no treatment for it. The nose was so sore and sensitive he was unable to blow it—with cracks and fissures in

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ala, and a large ulcer at upper junction of ala nasi with triangular cartilage; the cavity was full of crusts and scabs, which on removal showed almost entire destruction of the cartilaginous as well as the bony septum. Also entire destruction of the lower and middle turbinated bodies, the hiatus semilunaris in full view so that a probe could be carried into the antrum of Highmore without difficulty. There was no odor, nor had there been any.

This patient, like Dr. Hooker's, treated a few weeks then stopped all treatment; more gumma formed, broke down, and when he returned for treatment, despite *Kali. iod.* and *Mercury* a gradual destruction of the tissues took place, until all the septum, both cartilaginous and bony, was gone; the nostrils and antrum of Highmore of right side was one reeking filthy cavity—the tip of the nose was broadened and flattened, but as the bones forming the bridge of the nose remained intact there was not much deformity.

My method of cleansing was a little different from Dr. Hooker's. I used Marchand's Peroxide solution with a post-nasal syringe, followed by a Seiler solution; until all crusts were removed; all ulcerated surfaces were then treated with mercuric nitrate 3 per cent., argentum nit. 2 per cent., or comp. tinct. of benzoin; also the cracks in ala were treated, followed by a thorough application of nosophene, which I have found the best powder for all ulcerated surfaces of the nose, throat or ear, as it has all the good properties of iodoform without any odor at all.

I had the patient cleanse the nose night and morning with a Success syringe (which is a soft-rubber bulb with a perforated tube six inches long attached, and is the best thing of the kind I have ever seen for self use in atrophic syphilitic rhinitis or pharyngitis), followed by a spray of hydrastis oil, which prevents the crusts from sticking so tenaciously.

In atrophic rhinitis the same local treatment is beneficial, with the addition of a permanganate solution, or one of sanitas oil if there is much odor.

Dr. Rice: I have had some success in the use of the Shoemaker nasal syringe. I was led to its use in a case similar to Dr. Hooker's and found it more satisfactory than a straight syringe; and it is an instrument that any patient can use with safety. It is similar, I presume, to Dr. Hooker's. It has a rubber bulb with a shaft about three inches long, with numerous openings on the sides and on the end. The patient introduces it into the nose and forcibly presses the bulb, slowly drawing it forward. In this way the crusts are washed off and the nose thoroughly cleansed.

Regarding the medicinal treatment of syphilis, we should as homœopathists, apologize to ourselves if we depart from the line of treatment of giving the indicated remedy in small doses unless we do so in a perfectly open way: and yet I do not personally believe that we get very marked, quick or lasting effects from remedies given according to strictly homœopathic methods in the third stage.

The third stage of gummatous formation and ulceration is sometimes

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very rapid in its destructive processes: for instance, adhesion to the soft palate, perforations of the hard palate, destruction of the septum, etc., occur: and it seems to me that if one given line of treatment, no matter whence its source, is efficacious and will control those destructive processes, it is our duty to use it; but I do not believe that we should call it treating the case homœopathically.

What we want is the truth regarding the efficacy of our therapeutic methods, and this cannot be obtained by attributing cures to homœopathy which are performed in other ways entirely. It has been argued that iodide of potash is homœopathic to syphilis in the third stage. I do not believe that we have half the evidence of its homœopathicity to the disease as in the case of the bichromate, yet the latter drug is of little benefit here. These points should be freely and fully discussed.

Dr. Fred. D. Lewis: In regard to the internal treatment of syphilitic conditions, I noticed in Burt's Physiological Materia Medica several years ago that copper sulphate had been given and a series of fifty cases were reported at a meeting of the Paris Academy of Medicine where they administered $^1/_{16}$ to $^1/_6$ of a grain a day. I had two years ago a case referred to me, where the uvula was entirely destroyed and the soft palate was in process of destruction. The case had been treated for some time by his physician receiving the regulation treatment. I put him on a $^1/_{10}$ of a grain of cupric sulphur a day. The disease was checked and there has been no recurrence of any syphilitic condition for two years. In several cases since, I have given $^1/_{10}$-grain doses a day with marvelous results. I do not pretend to say that that is homœopathy. I do know, however, that I get results from it.

Dr. Hooker: In conclusion, I desire to say that I instruct patients with atrophic catarrh to consider their nose as much a part of their person to be taken care of as they do their teeth, or their finger-nails, or their ears. They have got to keep it clean if they have atrophic catarrh, or they will have the formation of these crusts and there will be odor. Therefore, with one kind of syringe or another, they must wash out these accumulations and do it persistently and faithfully, or there will be accumulations and odor. It must be a part of the toilet.

I sympathize and feel just as Dr. Rice does, in the treatment of syphilis. When I get a case of syphilis, I have to give mercury in appreciable doses, or iodide of potash, perhaps, in the later stages. I have made a number of faithful attempts to follow out what we call the indicated remedy in small doses, and I have had to stop because I did not dare allow the destruction to go on. That is all there is to it. Portions of the pharynx disappeared before my eyes till I began to give some of the remedies which I do not consider homœopathic, but which I find more effective than those which are purely homœopathic, therefore I use them, and I want to put myself on record as being, first of all, a physician. I am a homœopathic physician, I am glad to use homœopathic remedies if I can; but I want to use any means that are useful to cure my patients, and I do not consider that I am a mongrel or anything of the kind. I consider that I am an honest man, doing the best I can with the knowledge that is given to me.

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ATRESIA PHARYNGIS.

By Charles E. Teets, M.D.,
New York.

ADHESION of the soft palate to the pharyngeal wall may be congenital or the result of an ulceration of these parts.

Where the soft palate becomes adherent to the pharyngeal wall as the result of ulceration, it is either due to the carelessness of the patient or to the lack of proper treatment. Therefore before discussing the operative treatment, I wish to call to your attention the treatment for preventing adhesions of this part of the pharynx.

Usually these ulcerations are due to syphilis, and involve not only the pharyngeal wall but the posterior edge of the soft palate. During the healing process, the parts are not only apt to become adherent, but as cicatrization occurs there will be a strong tendency to contraction and closure of the opening from the ora-pharynx to the naso-pharynx.

By systematic dilatation this can be prevented. The patient should be seen every day if possible; the parts cleansed with a post-nasal syringe and after applying cocaine, the physician himself should dilate the opening. At the same time the patient should be taught how to use the post-nasal syringe and the dilator and instructed to make traction on the soft palate with the post-nasal syringe and dilator.

The symptoms are similar to those resulting from adenoids and different forms of nasal obstructions. Nasal respiration is obstructed compelling the patient to breathe through the mouth air which not being warmed, moistened or purified of its irritating elements, interferes with the functions of the pharynx and larynx. The pharynx is dry and the voice altered, having a muffled sound or non-resonant quality. The sense of smell and hearing is also impaired and the patient experiences great difficulty in clearing the nose.

There may be a complete or incomplete closure of the opening, but this makes but very little difference in the treatment because the difficulty usually met with is not the division of the adhesions but maintaining the artificial opening after it has been made.

Different methods have been devised to prevent re-adhesions and contraction. Some operators acting on the theory that re-adhesion was

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the main difficulty in overcoming these deformities have after the incision applied to the cut surface trichloracetic or monochloracetic acid. This establishes a superficial slough which is maintained in position a sufficient time to allow the edges to granulate beneath.

Dieffenbach after separating the adhesions passed a strip of linen through the nose and allowed it to fall below the free border of the palate so as to prevent re-adhesions. Dzondi packed the opening with charpie for the same purpose while Verneuil suspended in the pharynx a series of drainage tubes, strung on a thread, which was passed through the nose. Verneuil's object in using drainage tubes was not only to guard against a re-adhesion of the parts, but also to permit of the passage of air. In addition to this he instructed the patient to dilate the opening daily by means of a small rubber bag, acting on the principle of Barnes' uterine dilators.

Cook's device which is said to have been successful, consisted of a quadrilateral lead plate, suspended in the pharynx. After severing the attachments this was suspended in the pharynx by means of threads passed through the nose and worn for six weeks. Championniere constructed a curved silver tube which was passed from below upward between the palate and pharynx and held in position by arms attached to the third molars of the upper jaw. This device seems to have been worn with comfort and followed with excellent results.

One case came under my observation in which a seton had been used to make an artificial opening, but this was a complete failure as contraction and re-adhesions soon closed the opening. Lieven after separating the adhesions powders the parts with europhen and packs the naso-pharynx with europhen gauze for ten days. Then a rubber bag is passed into the naso-pharynx with a tube extending through the nares by which the bag is distended with air. This is worn for several hours each day.

Nichols method for the relief of adhesion of the velum palati to the pharyngeal wall is as follows: The pharynx having been cocainized, the thickness of the adhesion is ascertained by passing a curved steel bougie through the nostril into the naso-pharynx and palpating the end of it by means of the finger. An incision is then made in the medium line upon the end of the bougie. The next step in the process is the same as if the closure were only partial. An ordinary staphylorrhaphy needle curved to the right or left, as required, is armed with four or eight strands of coarse suture-silk. It is then passed through the center opening into the naso-pharynx and carried as far as possible directly outward; turning the handle it is then brought into the ora-

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pharynx, one end of the suture is grasped, the needle withdrawn and the ends of the suture tied near the central opening, leaving the loops loose enough to play freely through both perforations. If necessary, the same procedure is applied to the opposite side. The suture is moved slightly every day, and in from ten to fourteen days healing takes place, a small canal remaining, slightly larger than the diameter of the suture. Traction is now made upon the loop toward the medium line, in order to stretch the canal, and into it is introduced a staphylorrhaphy knife curved on the flat, the tissue between the two openings is then cut through and the parts kept dilated until healed.

Griffin reports a case which was successfully operated upon for the relief of adhesion of the soft palate to the posterior wall of the pharynx. He first dissected an opening into the upper pharynx by the aid of a sound passed through the nose. This was kept open by the habitual use of a dilator by the patient himself. Duncan had the blades of a pair of blunt-pointed scissors bent at a right angle, their points slightly curved forward to avoid the roof of the pharynx, and their outer edges converted into cutting blades. The parts being cocainized, the scissors were introduced, and by firmly opening them an incision was made over an inch wide. This was kept from re-uniting by using the scissors, their blades protected with cotton, as dilators, and occasionally severing the commencing adhesions at the angles of the wound with the naked instrument.

Dieffenbach and Lesser's plastic operation, where the adherent portion of the palate is turned about, in such a way as to form a palate whose healthy membrane faces the pharynx, and the raw surface presents anteriorly does not overcome the main difficulty.

From the different methods that have been employed to correct this deformity it is seen that it is a difficult matter to maintain the artificial opening and prevent contraction. It demands constant attention to obviate this and preserve a sufficient opening for functional purposes.

The method which I have found to be sucessful in maintaining the opening is as follows: Where an opening already exists it is enlarged by separating the adhesions as far as possible with a blunt angular knife and then applying to the cut surface trichloracetic acid to prevent re-adhesions. During the healing process contraction takes place with wonderful rapidity and closure of the opening can only be prevented by systematic dilatation. Therefore the patient is kept under daily observation and after anæsthetizing the parts with cocaine the opening is dilated. The patient is furnished with an angular dilator

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in the form of a blunt hook and taught to use it himself. He is instructed to use it several times a day not only while the healing process is going on but for several weeks after the healing is complete, passing it through the opening and moving it from side to side making at the same time traction upon the soft palate.

Where there is complete closure of the opening an oval piece is removed as near the pharyngeal wall as possible and the upper edge that is the portion looking towards the naso-pharynx and the lower edge that portion near the ora-pharynx brought together with a continuous suture. During the healing process and for several days following, the after treatment is the same as previously described for partial closure.

I furnish the patient with an angular dilator which I have had made for this purpose. Bosworth considers the ordinary flexible œsophageal bougie, the best instrument we possess for dilating purposes. This is passed from above downward through the nose, or inserted through the mouth, the patient easily acquiring sufficient dexterity to carry out this manipulation successfully.

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A METHOD OF CONTINUED IRRIGATION IN CASES OF PURULENT OPHTHALMIA, WITH INSTRUMENT DEVISED.

By E. Elmer Keeler, M.D.,
Syracuse, N. Y.

IN February, 1898 I gave before the Onondaga County Homœopathic Medical Society, a more or less extended review of the subject of ophthalmia neonatorum, its history and treatment, both by the old school and the new. This paper subsequently published in the Homœopathic Eye, Ear, and Throat Journal, of April, 1898, gave a very encouraging report tending to show most conclusively that as a school both among the specialists, and the general practitioners our results compared most favorably with those of the dominant school.

In the preparation of this paper I took occasion to correspond with many of the leading oculists of New York State in our school, inquiring as to the frequency of ophthalmia neonatorum, their treatment, and the results obtained. I also secured the statistics from many of the larger hospitals, where of course every precaution is taken against its occurrence, and in this way I was enabled to make a fairly accurate comparison of results in the two schools, both in private and hospital practice. I also mailed a somewhat similar list of questions to all of our local men who had enjoyed a large maternity practice. As a result of these letters, as then reported, I gathered reports from over 2,000 cases in private practice, and in that number there had not occurred a single case of total blindness following ophthalmia neonatorum, where the physician had delivered the mother.

Of these cases, 1 per cent., or 20 cases had developed the disease.

In studying the reports from both general physicians and oculists I was impressed with the unanimity of treatment which had been followed. In reply to the query, "What has been your customary treatment in these cases?" the invariable reply was, as a first requisite, "absolute cleanliness." This was followed by different physicians, with such drugs as boracic acid, argentum nitrate, calendula, listerine, &c.

As the result of this treatment, as has already been stated, not a single case of blindness had occurred in private practice covering over 2,000 cases, and the report came from Drs. Bissell, Norton and Deady

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that in their special practice they had never lost the sight of a single eye, where the case had been seen before opacity of the cornea had occurred. At this time the attention of the profession in New York was turned to this subject by the action of the old school who proposed to introduce a bill to the legislature which would make it a misdemeanor, if in every case, the physician or midwife in attendance, did not at once upon the birth of the babe, drop into the eyes a two per cent. solution of argentum nitrate. This was to be enforced by a fine of $200.00 or imprisonment not to exceed six months, or both. To make the need of such a law appeal to the public, statistics were offered, from old school institutions of course, showing that ophthalmia neonatorum was responsible for anywhere from 3 to 70 per cent. of all cases of blindness; their own authorities varying to that extent.

However, the percentage may arrange itself, there were two facts brought out by my correspondents. First, the absurdity of a law compelling the instillation of a drug in the eyes of each and every infant when only two out of each hundred were liable in ordinary private practice to contract the disease, and in 2,000 consecutive cases, none lost their sight; and second, that it was to methods as closely as possible approaching absolute surgical cleanliness, that we as a school owed our success in its treatment, and also in the treatment of other purulent diseases of the eye. It became very evident that the majority of our school looked upon the unnecessary use of a caustic in the eye of every babe as cruel, and unscientific to the last degree.

That surgical cleanliness was all that was needed, in the majority of cases became apparent, and to overcome the evident difficulty attending the treatment of purulent ophthalmia occurring at any age, I was lead to devise the instrument here shown.

It consists in brief of a hollow lid retractor made of hard rubber, having along its lower free margin three rows of minute openings communicating with the main tunnel inside, one directing its spray upward, one downward, and one inward.

The instrument is inserted under the upper lid with little difficulty on the part of the attendant, and causes very little discomfort to the patient, even when there is great chemosis.

When once in position, the tube of a fountain syringe is attached to the tunneled end, and a thorough cleansing is instituted, such as is quite impossible in any other way with which I am acquainted. Of course where treatment is not commenced until there is epithelial abrasion of the cornea, or actual sloughing of its tissues, the introduction

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of this instrument should only be intrusted to skilled attendants, but in any other condition it may be used by any one, to whom the usual cleansing of the eye would be intrusted. Following this method I find that the accumulated products, auto-inoculable in character, may be easily removed, and undoubtedly the greatest difficulty in the successful treatment of cases of purulent ophthalmia has been the thorough removal of this purulent infective material. Where the discharges are frequently and thoroughly removed, strong caustic injections are very seldom found necessary. The attendant usually finds great difficulty in cleansing every portion of an infected conjunctiva in an adult, and in children this is well nigh impossible, by the ordinary methods of everting the lids and attempting to remove the discharge. Also in many instances the lid was so tense from the inflammation that it was quite impossible to reach the most important part, the retro-tarsal fold. With this little instrument this is easily accomplished. It is a self-evident fact that unless a removal of all the purulent material is accomplished, that the disease process is sure to continue, and yet this was almost impossible, owing to pain caused by the necessary manipulation, and the swelling of the bulbar and palpebral conjunctival surfaces. Now the sulci may be cleansed with sterile water as often as necessary without causing the patient any suffering. Any antiseptic may be used as needed with the same instrument.

My attention has been lately called to the fact that a Dr. Pyle of Philadelphia has made use of an eye douche constructed upon somewhat the same principles. This is however more like an ordinary lid retractor, and would fail I believe to as thoroughly and comfortably irrigate the sulci as the one herewith presented. However this may be, the use of this instrument has demonstrated the fact that thorough and frequent irrigation is of the utmost value in the treatment of purulent ophthalmias.

DISCUSSION.

Dr. F. P. Warner: Dr. Keeler's paper is worthy of commendation as it brings the treatment of this disorder up to the most modern way of treating this disease.

The paper shows that the doctor has made a good deal of original research in investigating the treatment, both in the old school and that of our own, he having sought his knowledge from over two thousand cases, as reported by hospitals and physicians in general and special practice.

These statistics are, however, obtained from cases where the oph-

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thalmia neonatorium occurring in only one per cent. of the two thousand cases, has been under the care of a specialist, or in a hospital practice. Were these statistics gathered from the country districts the report would not be so flattering. Specific diseases from which this ophthalmia is generally contracted is not as prevalent in the country districts as in the city and larger towns; nevertheless, many cases of this disorder occur in the rural districts and the general practitioner throughout the country, knowing very little about eye diseases, does not impress upon the mother (many of them not being able to have a nurse), the importance of absolute cleanliness. Consequently a much larger percentage would occur in these country cases and more eyes would have to be reported "permanently damaged."

The paper of Dr. Keeler should be put into the hands of every practitioner outside of the cities especially, and much emphasis put upon the point of absolute cleanliness.

The instrument which the doctor has devised is no doubt a good one and evidently meets all the requirements in cases which have not gone on to ulceration or destruction of the cornea. In this condition the doctor states that the irrigation should only be left to experienced hands. True! but is this a good treatment for so serious a disease? Here every precaution should be taken to prevent any wounding or abrasion of the sensative tissues. This condition comes from a loss of nutrition to the cornea or from a pressure from the chemosis, and all manipulation which offers any danger whatever to the inflamed parts should be avoided. Here it seems to me a better plan is to cleanse the eye with bits of sterilized cotton wet in some disinfectant, and afterwards steaming of the eye with an ordinary steam atomizer as was commonly used for the throat for the purpose of increasing the nutrition. This offers a more rational treatment.

The instrument devised by the Doctor, though I have not seen it, could be easily used by a physician, but in some cases of nervous children it might trouble a nurse or the mother to adjust it. In such cases a small tube like the vaginal bent pipe of the Goodyear rubber syringe attached to a fountain syringe offers an easy insertion under the lid and accomplishes all that is necessary in the way of cleansing.

Some authors state that in former years a large proportion of all cases of blindness have resulted from this disease, varying all the way from twenty to seventy-nine per cent. But with the attention paid to cleanliness the percentage has been much less of late years; still more could be done along this line by absolute cleanliness at the time of parturition. A disinfectant douche before the delivery would prevent much of this disease as well as puerperal fever. No eye of a child should be bathed in the same water as its body, nor with the same cloth. Bits of absorbent cotton, using only one piece at a time, and dipped into a disinfectant wash, is the only proper way to cleanse the eye at birth or thereafter.

The original research of the doctor is much to be commended, and

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the invention of the new irrigator adds another instrument to the successful treatment of this purulent disease.

Dr. Payne: I would like to inquire of Dr. Keeler how his instrument is held in position after the insertion, and whether the eye tolerates the use of this instrument without the use of cocaine? Can it be kept in position any length of time and be tolerated by the eye? It seems to me, that the shape of the instrument would demand a right sided and a left sided instrument.

Dr. Moffat: I noticed at once that this instrument is made for the right or left eye. This may prove valuable because the essential of treatment is cleanliness of the conjunctival sac, but I hesitate to have any nurse or hospital interne introduce this or any other instrument.

I suggest the stem of this instrument be in the middle and prolonged into a handle so as to make an irrigating Desmarre's lid retractor—that could be used for either eye, and we could see what we are doing; it would be necessary to avoid the orifices along the edge having the effect of saw teeth.

Dr. Schenck: Not long ago in the Brooklyn Maternity Hospital with which I am connected, they had a large number of cases of ophthalmia neonatorum, some of them very destructive. Then they began to use Crede's method, which is still practiced, with the result that it has almost annihilated the disease from the institution. No purulent cases have occurred in five years, and no eye has been lost in that time. This method is strictly carried out there, and I think in institutions this method is very desirable. In private practice it probably may not be necessary.

Dr. Keeler: I should have stated that the instrument is made in pairs, one for either eye. It is light, easily used, and, conforming more or less perfectly to the curvature of the cornea, makes its introduction almost painless. In fact, comparing it with the ordinary process of everting the lid and cleansing it with pellets of absorbent cotton, this method is entirely painless. You simply raise the lid and this instrument slips into place very readily. After it is in position, there is no irritation following its use at all. If the child is very young it will lie very quietly and allow the irrigation to be continued half an hour. With the use of sterile water, at such temperature as you may see fit, I can see no possible objection that can be made against its use. We are certainly enabled to cleanse the conjunctival surfaces in a way that I never before have been able to do by any other method.

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MYCOSIS TONSILLARIS.

By Fred. D. Lewis, M.D.,
Buffalo, N. Y.

IN reporting my case of mycosis tonsillaris it is with the intention of placing it on record, rather than of establishing any new facts in regard to the disease or its treatment. The disease is of exceedingly rare occurrence; its etiology is uncertain, and the treatment has varied with almost every reported case. The literature is very scanty, while the microscopical examination of the growth has shown a variety of organisms; being constant only in the presence of the leptothrix buccallis. My case is peculiar in the fact that this supposedly essential element is so nearly absent that it can not be considered as the cause.

Case.—The child, eleven years of age, was brought to me by her father December 20, 1898, who gave the following history: About ten days previous to coming, the child had complained of a slight soreness of the throat, probably due to cold; the mother, always fearful of diphtheria, examined the throat and was alarmed to see both tonsils covered with a yellowish white deposit. She took her daughter to the family physician, who assured her that the disease was not diphtheria, but frankly admitted that he did not know what it was. He prescribed per-oxide of hydrogen as a spray, with no evident result at the end of a week. The father then asked him if he had any objection to the case being submitted to some one who could diagnose it; the physician said he would be glad to have this done, so I was consulted.

Looking through the meagre literature on the subject, I concluded that the disease was mycosis tonsillaris, and assured the parents that there was no danger, but that the cure would probably be very slow. I obtained a culture and also a portion of the growth for bacteriological and microscopical examination, with results as follows:

The bacteriologist to whom the culture was sent reported by telephone that the tube contained what resembled thrush. This I knew could not be the diagnosis of the case, as there were none of the characteristic thrush symptoms. The thrush aphthæ was absent; there was no soreness or difficulty in swallowing, no diarrhœa, absolutely no discomfort or constitutional symptoms. The thrush parasite is frequently found, however, in the mouths of healthy children, so I attached no importance to this report.

The flake, about the size of a silver five-cent piece, taken from the tonsil, was submitted to another bacteriologist for microscopical exam-

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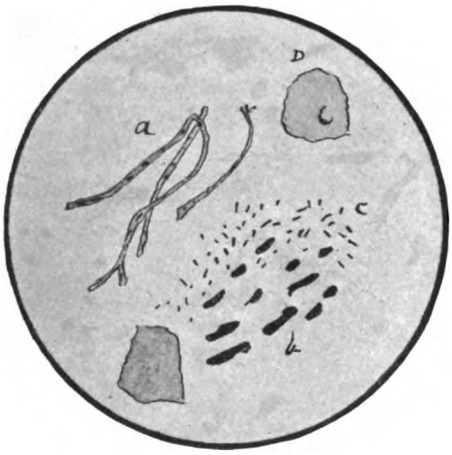
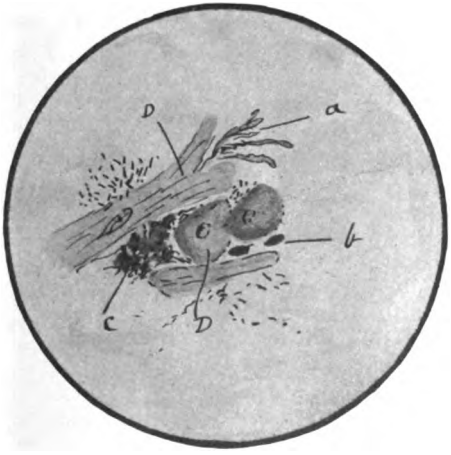


a. Leptothrix
b Ascomycetes
C- Bacteria &c
D-Epithelial cells

Cover-glass Smear Preparation Gram's Method
Leitz 2.0 Oil Immersion



a – Leptothrix
b – Ascomycetes
C – Bacilli
D – Various tissue elements

Section Gram's Method
Leitz 2.0 Oil Immersion

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ination. After about six-weeks' delay, the following report was sent to me:

"DEAR DOCTOR: Examination of sections made from membrane in case of suscepted mycosis, proves it to have been diphtheritic in character. The prevailing organism present is the B. diphtheriæ, associated with a few cocci. Yours truly, ——— ———."

Here again I concluded the diagnosis in error, as I had been in the South for over a month, and on return had found the case unchanged, with the exception of a decided diminution of the amount of the growth. The only explanation of the mistake that I could arrive at was that in the beginning the disease may have been associated with a mild form of diphtheria, and the spraying for a week with per-oxide of hydrogen had destroyed the B. diphtheriæ, while unaffecting the mycotic growth.

There still being a specimen obtainable, I sent a supply to a third bacteriologist, with the following result:

"The portion of the growth removed from the tonsil is a milk-white substance, soft and easily spread between cover-glasses, and after hardening in absolute alcohol, very brittle and easily crumbled.

Methods of Examination Used.—Portions of the fresh substance were teased in,

1. Caustic potash 2 per cent. solution,
2. In iodine solution,
3. Macerated in Ranviers' alcohol and teased in iodine, Farrants' solution.

Cover-Glass Specimens.—These were made by pressing a small portion of the fresh substance between cover-glasses and then quickly sliding them apart, fixing three times in the flame and staining in,

1. Gentian violet,
2. Picro-carmine,
3. Gram's method.

Sections.—The material was hardened in absolute alcohol imbedded in parafine and sectioned. The sections were fixed to cover-glasses and the parafine removed and then stained, in,

1. Hæmatoxylin, and eosin,
2. Methylene blue,
3. Gram's method.

The specimen showed the presence of numerous bacilli; the most numerous being a non-liquefying, non-chromogenic bacillus, resembling the diphtheria bacillus. Some threads of a leptothrix and some specimens of what was presumed to be some form of an ascomycetes.

The sections showed the presence of various tissue elements in a more or less state of necrosis, but not either the leptothrix or ascomycetes in such quantity as to say that either was the cause of the growth.

The clinical features of the case show it undoubtedly to be a case of mycosis, but in the present state of our knowledge of both leptothrix and ascomycetes it is not possible to say which is the cause in this case —probably both being instrumental in its formation."

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The drawings made from these examinations are herewith attached, showing the leptothrix and ascomycetes.

This case was of so much interest to me, and I was so anxious to arrive at the proper conclusion as to its nature, that I took the girl to the meeting of the Western New York Homœopathic Medical Society in January, and exhibited the throat to its attending members, about fifty in all, none of whom could positively diagnose it, but not one suggested diphtheria.

The parents of the child are both American of German descent, both healthy, and having several healthy children. The little patient was not strong as a baby, being only five and one-half pounds' weight at birth, but now is quite as strong and active as most children of her age.

The growth had none of the appearance of the diphtheric membrane. Instead of being smooth and of one piece, it is rough, uneven, and fungus-like, in appearance.

The growth, when most plentiful, came away with the forceps in flakes; later, when somewhat reduced, it was as if pulling out tufts of moss. Portions of it could be removed at any time without bleeding.

My treatment consisted only of the application each night, to each tonsil, of powdered borax. With this the growth gradually diminished until May 20th, when but a small spot on each side, springing evidently from a deep crypt in each tonsil remained. The child was not suffering, nor had at any time suffered in the least, from the presence of the growth, yet as the parents were anxious to have it cured, I applied deeply trichloracetic acid. A week later finding that the one application had not entirely destroyed it, a second application was made, and this finished it up.

The only cause to which I could attribute the growth was the presence of a decaying tooth, which I advised the parents to have attended.

The following descriptions of the disease led me to a diagnosis:

Ivins: "Mycosis is a painless and rare affection. Its favorite site is the crypts of the tonsils, during chronic lacunar inflammation. . . . They appear as white or yellow deposits, not unlike diphtheria, when uncomplicated, are devoid of pain or inflammation, and impart a sensation of hardness."

Bosworth: "When the spores of this plant lodge upon the mucous membrane of the fauces, these small thread-like bodies, augmenting rapidly by fusion, multiply themselves, gradually building up the plant-like mass of spores which is easily recognized on gross inspection, standing out from the surface of the mucous membrane as small, pointed, wart-like projections of a clear milk-white, chalky color. The presence of this growth in the faucial mucous membrane seems to be tolerated with almost entire impunity, for it excites no inflammatory changes whatever in the membrane proper, the symptoms being of a

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purely mechanical character. It usually occurs in individuals in the enjoyment of perfect health, and its presence seems to give rise to no general disturbance."

Bishop: "This is a very rare parasitic disease of the superior pharyngeal space, including the tonsils. Small white or yellow growths appear, projecting above the mucous membrane, instead of occupying a recessive position, as is the case with tonsillar concretions. . . . It has, in some instances, a fungoid appearance. . . . Its diagnosis is easily made, since the symptoms of inflammation characterizing pharyngitis, tonsillitis, etc., etc., are wanting."

Other authors might be quoted to establish a diagnosis, but I think these are sufficient.

The conclusion I have drawn from the case is that the bacteriologists, owing to the rarity of the disease, did not recognize the presence of the leptothrix, in the first examinations, or that mycotic growths may exist independently of its presence in sufficient quantities to be certain that this form of growth is an essential factor in mycosis.

DISCUSSION.

Dr. George H. Quay: In the oro-pharyngeal cavity we find mycosis presenting in two forms. (1) Small, white points, the commoner variety; (2) plaques of a yellowish color, somewhat resembling diphtheria patches.

When appearing on the tonsil it is to be distinguished from lacunar tonsillitis. In the later condition the exudation appears at the mouths of the crypts, and it is easily raised off with a probe, the small white points of mycosis are not apt to spring from crypts, but from the mucous membrane between the crypts. It is to be distinguished, from the various form of acute angina, which give rise to general symptoms; from diphtheria, where cultivations will confirm the diagnosis. Again, the small points stick tenaciously to the epithelium, after the top is pulled off it persists in growing unless its sub-mucous portion is destroyed. Frequently the surrounding tissue has a healthy appearance, at least there is no surrounding inflammatory areola.

The first case of mycosis to come under my observation was some seven years ago; since then I have had three other cases, all presenting under the microscope the characteristic rods of leptothrix. All four cases were of the first variety mentioned—*i. e.*, small white points.

Regarding the treatment, I have used the bichloride, hydrogen dioxide, alum, iodine, and the iron salts, with negative results. I do not believe that we possess an agent that will destroy the fungus, except the cautery.

One writer claims that tobacco-smoking cured a case. It is more probable that it was a case of spontaneous recovery, as it is well

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known that mycosis frequently disappears without any treatment whatever. In the first case to come under my observation the patient smoked at least twelve cigars a day. If there is any efficacy in tobacco to destroy the fungus, certainly that man smoked enough to floor it.

Regarding the case presented by Dr. Lewis, I am of the opinion that if it was mycosis, it was the second variety mentioned—*i. e.*, presenting as plaques of a yellowish color, and furthermore that diphtheria was also present. I believe that the reports of the bacteriologists will substantiate this view. The first report is not to be considered as it is too indefinite: the second one reports, "The prevailing organism is the bacilli diphtheria"; the third and altogether the most satisfactory report says, "The specimens showed the presence of numerous bacilli." The most numerous resembling the diphtheria bacillus. Also various tissue elements in more or less state of necrosis, but not either the leptothrix or ascomycetes in such quantity as to say that either was the cause of the growth.

In view of the reports quoted it seems to me to be very clear that the opinion above expressed is maintained, that if the case was mycosis there was also present a mild form of diphtheria.

Dr. Haywcod: I want to report a very similar case. A young man of twenty-five, whom I saw a few months ago, had what at first I took for a very simple case of tonsillitis, and prescribed the usual remedy without benefit. When he came back, I made a more careful examination, diagnosed it as mycosis, used the galvano-cautery. Later the trichloracetic acid was used, and in a few days' time he was entirely cured.

Dr. Lewis: I wanted to get all I could from microscopic examinations, and I was not anxious to cure the case too quickly. If I had another case, I should burn the tonsils with the actual cautery.

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THE INFLUENCE OF HYGIENE UPON THE UPPER AIR TRACT.

By Herbert W. Hoyt, M.D.,
Rochester, N. Y.

IS it true that specialists are inclined to lose sight of the fact that the human body is composed of many members all more or less interdependent?

Dr. Sheppegrell recently said: "The nose and throat specialist should avoid the tendency of becoming narrow in his views, and of seeing the patient only through the nasal speculum and laryngoscopic mirror; he should be as familiar with matters of general medicine as the general practitioner, and should make it his motto not to know less of general medicine, but to know more of rhino-laryngology."

This is not laying out an easier field of work for the specialist, but a harder one. It seems strange that there should be any question as to whether the condition of the abdominal organs influences the upper air tract. But so eminent an author as Bosworth says, in his text-book, "The mucous membranes of the different portions of the air tract are in exceedingly close sympathy, and a morbid process in one portion is very likely to be followed by a morbid process in another, but that there is any sympathy or connection between the mucous membranes of the air tract and the mucous membranes of the food tract I do not believe." Later, in a discussion in the American Laryngological Society, he partially retracts, and says: "Constitutional state has very little to do with diseases of the nose, but very much to do with the naso-pharynx." Every one else in the discussion took the ground that the whole air tract was influenced by the other organs.

The anatomical nature of the upper air passages, with their abundant supply of blood-vessels, makes them physiologically and pathologically very susceptible to congestion. The lymphatics, so prodigally supplied in the naso-pharynx and pharynx, make a nidus for auto-intoxication surpassing any other portion of the body. General practice teaches one to know that indigestion and constipation cause congestion of the portal circulation. Obstruction in this large venous system causes congestion in more remote regions. By inquiry it is nearly always found that constipation or indigestion is a characteristic of those

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troubled with hypertrophic rhinitis. It is commonly known that one often takes cold after a very hearty dinner or late banquet, but the portal obstruction or congestion is not the only factor in such cases. The intestinal tract is a very fertile source of auto-intoxication, if the fermenting matter is not readily passed off, and, when produced, how can this poison be thrown out of the system, except by the kidneys and mucous membranes of the respiratory tract?

Another interesting reflex relation is that of the genital organs upon the upper air passages. Dr. J. N. Mackenzie has given some very valuable information on this subject in a paper entitled, "The Physiological and Pathological Relations between the Nose and the Sexual Apparatus of Man." An immense amount of research is displayed in this paper; and plenty of evidence is given to show that the venous and nerve supply of the nose are markedly influenced by the generative organs in either sex. Excessive venery has been the direct cause of hay fever, asthma, hypertrophic rhinitis and perversion of the olfactory sense.

The text-books on general medicine speak of the nose and throat manifestations of the exanthemata, typhoid, scurvy, rheumatism, eczema, syphilis, tuberculosis, diphtheria, &c. Bishop lays considerable stress on the uric-acid diathesis being at the bottom of many catarrhal conditions.

Wells has gone very thoroughly into the relations of the skin and the upper air tract, and shows conclusively that the nose suffers severely when the skin is not doing its duty. Hajek, of Vienna, said: "Unless one has devoted a certain amount of time to dermatology, he is not competent to intelligently diagnosticate the diseases of the nose and throat."

With this partial review of the relations of the general system to the upper air passages, what path is shown to the specialist in this line? To quote from an editorial in *The Laryngoscope:* "The fact remains that surgery should be employed to as little an extent as is compatible with the abnormalities present in the case; then local constitutional and hygienic treatment must be depended upon to remove the *cause* of the disease. Removal of the *result* does not materially affect the *cause.*" Diathesis cannot be eliminated in a day.

Attention will be called to some of the directions in which hygienic measures will assist in relieving troubles in the upper air tract, where surgical interference will not cure. From the public point of view this

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takes up the questions of ventilation, sewage, heating, dust, noxious weeds, pure foods, &c.

Many public and private buildings are very poorly supplied with fresh air. Nothing is so trying to the mucous membrane of the nose as its attempt to render superheated and foul air fit for entrance to the lungs. Hypertrophy is produced and greatly aggravated by such efforts. Many children with slight adenoids are in excellent condition during their summer vacation, with its out-door life, but as soon as they are shut up in the poorly aired schoolroom they find difficulty in free breathing and, in consequence, have headaches and kindred symptoms. Our modern houses are an improvement over those of European nations, but there is a great danger in having the living-rooms too warm and the air too dry.

Another source of much discomfort is the large quantity of dust and soot in the street air, especially in the cities. It is the duty of every community to have its streets as clean as possible, and oblige manufacturers to prevent the smoke nuisance. When the automobile replaces the horse, the main source of our uncleanly streets will be obviated.

It is generally believed that the rag-weed and golden-rod are the chief causative factors of hay-fever in the predisposed. These weeds are of no value in the human economy and the day should come when legislation will compel the public to destroy, in so far as possible, any weed apparently injurious to health.

The food question is both of public and private interest. It ought to be possible for one to obtain pure food products, and the laws should be so rigidly enforced that a label on any food should tell the exact truth as to its purity.

As before suggested, obstruction and congestion in the portal circulation bears a direct and marked relation to the congestion in the mucous membranes of the nose and throat. Pure, healthful foods properly prepared and thoroughly masticated, will prevent and cure indigestion and its accompanying ills, other things being equal. Pork, veal, fried foods of all kinds, pastry, hastily cooked cereals, condiments, coffee, tea, and new bread are not good foods for any one. A number of students coming under the writer's care have found their catarrhal tendency much lessened by rejecting some of the articles on the boarding-house menu and by taking more time for eating. Of course, a man who works hard out of doors will digest almost any food, but in the long run it is at the expense of his stomach and its helpers. The Jewish race is proverbially a healthy one, and there is no shadow of a doubt

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that it is due, to a very large extent, to their custom of not eating pork. Tuberculosis, which claims so much attention from the nose and throat specialist, is rare with the Jews. There is absolutely no other ground for argument why the Jews are so exempt from tuberculosis, than on that of abstaining from the use of pork, for a large class of them are otherwise unhygienic. Tobacco and liquors dry and engorge the membranes of the upper tract both directly and reflexly. A man who is engaged in a sedentary occupation must be more careful in eating than one who has plenty of exercise. Meat once a day for any indoor man is enough. Beans and peas contain the same kind of nourishment, in larger proportion, as meat, are cheaper, and, if well cooked, more easily digested.

Exercise is a prime factor in aiding digestion and keeping all the eliminative organs in active condition. The writer has a patient who is a teacher. Throughout the school year he suffers greatly from congestion of the nasal mucosa, but during his vacation of hunting, fishing and camp life, he throws off his catarrhal condition entirely. Mulhall tells of two prize-fighters who were subject to hypertrophic rhinitis when not in training. After a course of work in preparation for a match, their bowels become regular, the skin soft and smooth as satin and all congestion in the nasal mucosa disappears, leaving no trace of the former need of hawking and spitting. The same author recommends sawing wood, in the old-fashioned manner, as a most excellent form of exercise. This gives the kneading action to the diaphragm and bowels, which relieves the portal, and reflexly the nasal congestion.

Next in importance to exercise is bathing. Some one has said that the skin is the external organ of respiration, and if it is healthy and active, there is less likelihood of taking cold in the varying changes of weather. By the cold bath the system is made more tolerant of draughts and sudden exposure, by teaching the arteriols to expand and contract readily. The skin is not really toughened by the bath, but the glands are kept sweet and clean and the eliminative function is given free play. A pair of loose, thumbless mittens, made of heavy Turkish toweling, are most convenient for a cold bath. Then with both hands one can quickly and thoroughly go over the whole body. This should be immediately done upon getting out of bed and followed by a brisk rub, the whole process not occupying over three minutes. If one is strong enough to enjoy it, a shower or plunge is excellent. The cold bath should be begun in early life.

In this connection might be mentioned the great benefit of cleanli-

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ness and antisepsis in some nasal diseases, as hay-fever. The writer has had very satisfactory results in a violent hay-fever by daily thoroughly cleansing of the nose with a mild antiseptic during the period of attack. Nothing else ever gave this patient such relief. Hollopeter cites two hundred such cases with astonishing results.

No hard and fast rules can be laid down about clothing. Some cannot wear wool, while others do better with it. According to the variations in the weather the clothing should be changed. Regularity in eating, sleeping, and exercise is the salvation of many men.

This paper was not written to decry necessary surgical work, but rather in the hope that it might diminish the reckless destruction of the mucous membrane of the upper air tract. The turbinated bodies are very useful, when not maltreated by disturbing influences in other parts of the body. Homœopathic remedies will help restore crippled functions, when combined with proper hygienic living. Would that it might be said of the members of this Society that they make it their first business to correct the wrong methods of living, and that they resort to surgery only in cases where it is needed.

DISCUSSION.

Dr. Townsend: This subject is, in my opinion, the *most important* one that we, as specialists, have to consider, and it behooves us all to give it careful attention. When a specialist loses sight of the fact, that the organs to which he has given his thought and attention, are only a part of the most intricate combination of vital elements ever associated together, and that in addition to the *physical,* the *mental* and *spiritual* elements are essential to form the complete human organism, he is liable to see things from a standpoint, which shows only a glimpse of *one side,* rather than the *broader* view, which takes cognizance of everything that a careful analsyis of the case reveals, before arriving at a conclusion.

The doctor refers to most of the predisposing causes of inflammations of the respiratory mucosa, and, in the main, I would indorse his conclusions.

The *nervous* and *digestive* systems play most important rôles in relation to catarrhal inflammation of the upper air tract, as every observant practitioner knows, and it is sometimes difficult to decide which is responsible, and to what degree either may assume the relation of *cause* and effect. Nervous relation is largely reflex, and assumes a variety of manifestations.

I would *emphasize* very emphatically the influence of impaired digestion and assimilation, together with diminished elimination of waste products, as a predisposing cause of these troubles. This is beyond

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doubt the chief cause in a majority of cases, if we include the phenomena of *sub-oxidation,* or, in other terms, a disproportion between assimilation and elimination.

Lithæmia is a phase of this same condition.

Haig's work on "Gout and Its Cause" throws much light on this subject, and contains valuable information regarding the action of uric acid and other waste products when retained in the body. *Lack of exercise* and *overeating* tend to cause a sluggish action of the liver and kidneys, and unless the skin assumes an increased share of the burden, there will be trouble.

The cold bath in the morning, is a boon to such patients. Simple *calisthenic exercises,* and *massage* are invaluable. Riding on horseback is a *great aid* in overcoming the evils of sedentary living.

My observation does not confirm the statement that the Hebrew race enjoy a large degree of immunity from tuberculosis. Without referring to the records, I am inclined to think that they furnish a fair share of the tubercular cases treated in my clinic.

The suggestion that peas and beans furnish the same nutritive elements as beef, is incorrect, and probably not intended. That they are a good *substitute* for beef is very doubtful, as the overfed patient usually suffers from intestinal indigestion, and does not tolerate starchy foods. Milk foods, fruit, green vegetables, pure water, and exercise are a panacea for such patients.

Neurasthenics furnish us many patients, some of whom are found to have the *cause* of their infirmity in a nose or throat lesion. Others may be free from local trouble, and *affect,* or perhaps *feel,* some irritation in the nose or throat. A slight operation often relieves them, but only temporarily as a rule. They are impressionable and influenced by suggestion, and probably many of our brilliant cures (?) are due to that fact, instead of the other treatment.

A very valuable adjunct to treatment (particularly in women patients) is the regular practice of *breathing exercises,* at stated intervals and according to strict orders. In sedentary patients, this usually produces marked results, improving the circulation and the digestion, as well as having a favorable effect on the local condition.

Dr. Hoyt: I was persuaded to attack this subject by seeing the careless way in which hygienic matters are treated in many of the clinics that I have attended. They take patients and give them some medicine, or make a local application, cut off a spur, cauterize something, and say nothing about hygiene. That is especially applicable to the tenement-house class, who greatly need hygienic instruction. At one of our Western New York meetings within the past year, the question of pork came up as meat food, and one of the Doctors arose and said: "Who ever saw a Jew who had tuberculosis? It is because they do not eat pork." Of course, there are Jews who have tuberculosis; but there are very few, and you will so find in an examination of the statistics. As for beans and peas, according to our laboratory experiments, they contain in proportion to meat about seven times, I believe

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it is, as much of the proteid element. If they are thoroughly cooked and that means a number of hours' boiling if they are boiled, or a very long preparation in otherwise cooking them, because a bean partially cooked is very hard to digest. Once thoroughly cooked they will take the place of meat. If you want further information in that regard, read some of the experiments at Battle Creek, Mich. I know some of you may think it a sort of fad referring to Battle Creek—but they have put out some good work.

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SUBCONJUNCTIVAL INJECTIONS IN THE TREATMENT OF OCULAR DISEASE.

By Charles Deady, M.D.,
New York.

MY attention was first directed to this subject during the fall of 1892, when I made the acquaintance of a young physician who had been an assistant in the clinic of Dr. Darier, of Paris, France, and who was returning to his home via New York.

He brought me an article on subconjunctival injections, which had shortly before been read by Dr. Darier before the Société Françaís d' Ophtalmologie, and which was published in the Journal of January, 1893.

My visitor explained the modus operandi of the treatment and was so enthusiastic over some of the results obtained, that I became interested and began to look the matter up.

In the paper referred to, Dr. Darier presented 18 cases in which the injections had been used, furnishing a brief history of each case, with plates showing the condition of the fundus. Of these cases, 11 were either central choroiditis or chorio-retinitis, 4 were disseminated choroiditis, 1 each of the pigmentary form of choroiditis with atrophy of vessels, of syphilitic chorio-retinitis with atrophy of the nerve, of general chorio-retinitis and of neuro-retinitis.

Case No. 1 was of central chorio-retinitis of 15 days' standing, which failed entirely to respond to mercurial frictions continued for 8 days. Here the vision was improved from 1/4 to 1 by a series of injections of sublimate, the lesion clearing up so that there was no trace of it one year later.

Case .No. II. of central chorio-retinitis of three-months' duration. After two-months' trial of mercurial friction and iodide of potash without effect, vision was brought up from 1/8 to 1 by six injections of sublimate and the anatomical lesions almost disappeared.

Case III., central chorio-retinitis, vision was raised from 1/2 to 1 by eight injections.

While the results obtained were not so excellent in other cases as in those quoted, vision was very much improved in all the macular lesions, including those due to myopia. In disseminate choroiditis, the improvement was less marked but still considerable, and the only case

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in which the treatment failed entirely was that of neuro-retinitis.

From that time on, as suitable cases presented, I began to use the treatment. The method adopted was to cocainize the eye with a 4 per cent. solution, then by means of an ordinary hypodermic syringe made entirely of metal, and capable of being rendered absolutely sterile, an injection of one drop of a solution of bichloride of mercury 1-1000, which had been previously filtered, was made beneath the conjunctiva.

It soon became manifest that the amount of reaction varied according to the site selected for the injection. If made too near the ciliary border of the cornea, or too far away from it the reaction was increased. If it was so entered as to strike one of the small vessels, there was considerable ecchymosis, with resulting increase of inflammatory action and often pain lasting from 12 to 24 hours. After a time it was demonstrated that the best site for the injection was midway between the corneal border and the cul-de-sac, avoiding, so far as possible, the vessels. One thing which was beyond control was the tendency to wound the sensory nerves supplying the part. This would result in immediate and sometimes severe pain, which soon subsided in some cases and in others lasted until the inflammatory action aroused by the injection wore off, which was usually in 48 hours, at most, and on experimenting it was found that the period could be shortened by the use of the ice-bag.

Occasionally, when fortunate enough to avoid all vessels and nerves, the reaction would be very slight, and with perhaps no pain at the time of the injection.

A few cases cited from a number treated, will be sufficient to show the results obtained.

Case One.—Miss O., æt. 43. Myopia et choroiditis centralis O. D. et staph. post. O. D. $^{3}/_{200}$ — 16 Ds ⌒ — 3.50 Dc axis 15° $^{20}/_{100}$.

After six injections, with the same glass, vision O. D. $^{20}/_{30}$.

Case Two.—Mr. L., æt. 20. Amotio retinæ O. U.

R. V. = $^{12}/_{200}$, L. V. = $^{6}/_{200}$.

After 3 injections R. V. = $^{15}/_{200}$.

After 4 injections L. V. = $^{8}/_{200}$.

Case Three.—Miss K., æt. 19. Astig. reg. myopia et staph. post.

O. D. V. = $^{3}/_{200}$ — 11 Ds ⌒ — 2.50 Dc ax 15°, V. = $^{20}/_{70}$.

O. S. V. = $^{3}/_{200}$ — 13 Ds ⌒ — 2.50 Dc ax 180°, V. = $^{20}/_{100}$.

After 4 injections R. V. with same glass = $^{20}/_{30}$??

After 5 injections L. V. with same glass = $^{20}/_{30}$?

Case Four.—Geo. W., æt. 9. Chorio-retinitis cent. O. D.

R. V. = $^{20}/_{70}$. After 3 injections R. V. = $^{20}/_{40}$?

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Patient was then lost sight of.

Case Five.—Henry B., æt. 47. Chorio-retinitis cent. et myopia.

O. D. $^{20}/_{200}$? eccentric — 1.50 Ds V. $=^{20}/_{100}$?

O. S. $^{20}/_{200}$? eccentric — 1 Dc ax 90° V. $=^{20}/_{100}$?

After 4 injections in each eye, V. $= ^{20}/_{100}$ easy, each eye with same combination.

Case Six.—Miss D., æt. 24. Myopia et staph. post.

O. D. V. $= 1\frac{1}{2}/_{200}$ with — 22.50 Ds V. $= ^{15}/_{100}$.

O. S. V. $= 1\frac{1}{2}/_{200}$ with — 20 Ds V. $= ^{15}/_{50}$.

After 7 injections, R. V. $= ^{15}/_{12}$?? with same glass.

After 5 injections, L. V. $= ^{15}/_{12}$?? with same glass.

About 18 months later this patient again presented and upon examination I found that vision had deteriorated in the interval, the status præsens being as follows:

O. D. with — 22.50 Ds V. $= ^{15}/_{40}$.

O. S. with — 20 Ds V. $= ^{15}/_{40}$.

The treatment was again resorted to and after three injections, vision was raised in each eye to $^{15}/_{20}$, when the patient discontinued her visits.

Case Seven.—Mrs. C., æt. 59. Amotio-retinæ O. S.

O. S. V. = fingers 1 ft. After four injections vision $^{8}/_{200}$ letters, no further improvement

Case Eight.—Mr. B., æt. 50. Sclero-choroiditis post. et myopia.

O. S. $^{8}/_{200}$ — 16 Ds $\frown$ — 2.50 Dc ax 165°, $^{20}/_{70}$.

After one injection, with same glass glass, V. $= ^{20}/_{50}$.

The case was lost sight of as patient ceased his visits.

These experiments certainly seem to indicate that there is something in the treatment if carefully used in selected cases. I have used it on a considerable number of patients besides those above noted, and my conclusions as formulated in my own mind are that it should be beneficial in some cases of disseminate choroiditis, if used early enough; I have seen very little benefit in this type of disease when the stage of confirmed atrophy of the choroid has been reached. In the exudative stage I should look for some improvement, and if I am not mistaken, Darier has reported two or three cases of this stage which were benefited.

In central chorio-retinitis, several good results have been obtained and Darier has published a number of cases in which the treatment accomplished all that could be desired, as in his cases Nos. I. and II., quoted at the beginning of this paper, where vision was not only restored, but the ophthalmoscopic signs of the lesion also disappeared. These cases, however, were both of recent origin, No. I. being of only 15-days' standing and No. II. having had a course of three months.

In this type of disease, therefore, the injections should be given a

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fair trial, more especially as these cases do not readily yield to the action of internal medication. In the *Recueil d'Ophtalmologie* of May, 1892, Darier among other things says that he has had excellent results from the injections in cases of simple amblyopia, other than those of toxic origin, and it has been in something akin to this that I have had the best success. We are all familiar with the fact that in certain cases of myopia, even where there is comparatively little posterior staphyloma, there is sometimes a considerable difference between the best vision obtainable by glasses and the normal. It is just here that I am able to recommend the bichloride treatment. By its use in a number of such instances, vision was increased to a greater degree than has ever been possible by any other method, at least in my experience, and I look upon them at the present time with much more equanimity than formerly. Some of them, it is true, fail of relief, but in a number the results have been gratifying. Other observers seem to have had equally good results in this form of trouble, as is instanced by the reports of Gepner (*Centralblatt für Praktische Augenheilkunde,* Leipzic, Jan., 1894), of 20 cases of myopia with choroiditis, which he put on the treatment and in which not one failed to derive some benefit. Three of the Darier cases, published in the JOURNAL, were myopic-choroidal affections, all of which were materially helped, and Sidlossy (*Arch. d' Ophtal.,* July, 1898), recommends it for "high myopia" among other conditions mentioned.

The sublimate injection treatment, like many other new remedial measures, seems to have been tried by old-school ophthalmologists on nearly everything that presented and with results which vary widely. Thus Darier, Briggs, Lagrange and others, seem to consider it specially useful in syphilitic forms of disease, while Galezowski has abandoned the treatment in such cases on the ground that it is useless and dangerous.

A number of investigators recommend this method especially in diseases of the uveal tract, but Terson (*Annales d' Oculistique,* May, 1894), takes the opposite position, and claims that deep involvement is a contraindication. This writer, by the way, having noticed that vascularity around the cornea, commonly followed the subconjunctival injection of the bichloride, began to use it in conditions where circumcorneal congestion was present, and the cure of a case of episcleritis as a result.

This seems to the impartial observer to be a dangerous tendency toward Homœopathy.

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Veasy (*Therapeutic Gazette,* Jan. 15, '94) claims a good result in a case of scleritis, and to those who are acquainted with the slow and imperfect results of ordinary treatment in this tedious disease, the statement will be welcome. In a second case, however, the result was nil.

The method has been used upon most of the diseases of the conjunctiva, cornea, iris, ciliary body, choroid, vitreous humor, retina, and optic nerve. So far as can be gathered from the mass of contradictory report, it appears to be of good service in iritis, irido-cyclitis, choroiditis, irido-choroiditis, and choroido-retinitis, whether syphilitic or otherwise, being apparently especially useful in those affections of the macular region, which are so destructive to vision. Next, it would seem to have been effective in the hands of some practitioners in superficial lesions due to infection. Abadie claims to have aborted sympathetic ophthalmia by this means. It is reported to be of little or no use in diseases of the optic nerve and retina proper.

The dose varies from the careful use of a single drop of the 1-2000 solution to De Wecker's massive dose of a whole syringe full of the same; a majority, however, inclining toward one or two drops of a solution of 1-1000.

Respecting its local effects Bull (*N. Y. Med. Jour.,* Jan. 19, 1895), states that it always causes severe pain, notwithstanding careful and persistent use of cocaine, and that the reaction is apt to be severe and sometimes very severe.

Mellinger (*Archiv für Augenheilkunde,* Wiesbaden, Nov., 1894) says that the injection of a 1-2000 solution is very painful and causes an adhesive inflammation which obliterates the subconjunctival space, and he believes that a normal salt solution is equally efficacious, without these objections.

Darier has repeatedly denied the latter statement, and is corroborated by Wilder (*N. Y. Med. Jour.,* Nov. 28, 1896), who is equally positive in this respect.

Personally, I have never used the treatment except in choroiditis, chorio-retinitis and the single case of detachment of the retina (in which it failed), for the reason that I felt that we had better means for the relief of the other forms of disease. The pain, as before stated, has been found to depend on the site of the injection. The obliteration of the subconjunctival space by adhesive inflammation is, I think, a common though not invariable result, but it is confined to the parts immediately affected by the operation. Where a number of injections are

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made in the same eye, however, this adhesion may extend over a considerable portion of the membrane.

As to the reaction, I have never seen it so severe that it was not relieved inside of 24 to 48 hours by the icebag, and in many cases it has been very slight. Possibly my good fortune in this respect may be due to the fact that I have always allowed a period of at least five days and often a week or two, to elapse between injections. In other words, no second injection has been made until the eye was entirely recovered from the previous one.

In all the cases which have been under my observation, there has been no serious result of any kind. In the *Archiv für Augenheilkunde,* Wiesbaden, Apr., 1895) Darier says that both the adhesions and the severe pain are caused by making the injections too deep in Tenon's capsule or too near the border of the cornea.

Mellinger and Bossalino (*Archiv für Augenheilkunde,* Wiesbaden, June, 1895), as the result of an experimental investigation, conclude that the injected fluid follows the large lymphatic spaces over the whole surface of the bulbus and optic nerve, entering also the supra-choroidal spaces and under the sheath of the optic nerve. They agree with Zehender that the beneficial effect is a result of stimulation of the lymph circulation, and consequent acceleration of the removal of infectious material.

E. H. Bernstein (*Jour. Am. Med. Ass.,* Sept. 12, 1896) advises the use of the cyanide of mercury rather than the bichloride, claiming that it is more quickly and completely absorbed. He claims to have had excellent results and he is supported in this statement by Lagrange and Fromajet, by Chavellereau, Dunn, and others.

DISCUSSION.

Dr. R. S. Copeland: Dr. Deady has succeeded, as he always succeeds, in giving a clear-cut, interesting description of a comparatively recent method of treatment. In outlining its field of usefulness, the essayist neglects to state another possible use for the subconjunctival injections. This is in the absorption of blood from the anterior chamber and vitreous. Mellinger calls attention to the great value of four-per-cent. salt solution in these cases. My own experience leads me to accept his statement that the absorption under this treatment is much more rapid than when left to itself.

When I last visited DeWecker's clinic he was using bichloride injections for every abnormal eye condition from fundus to cornea. I felt then, as I now feel, that, in the light of DeWecker's results, the homœo-

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pathic specialist has no occasion to apologize for his internally administered treatment.

In certain conditions the subconjunctival injection has an undoubted value. Salt, with its affinity for water, takes it from the tissues and hurries the nutritive processes. Mercury is a remedy many times useful in certain forms of eye diseases. But, in my judgment, the indiscriminate use of this method of treatment is bound to be productive of more harm than good.

With no desire to criticize this most excellent paper, written by a man of undoubted faith in our law of cure, I do wish to inquire why we need spend much time on the uncertain therapeutic whims of the dominant school? When it has demonstrated in any disease a method of cure *equal* to our own, that method deserves our consideration. When it can show results *superior* to ours, we fail of our duty if we neglect to adopt it. But as I have compared the results of our remedies with the results of this method, I am more than ever convinced that *similia* gives the patient a hope of cure that is denied the victim of the subconjunctival injection.

In the absence of clear definition of the end sought in any given case and without well marked indications for it, I do not believe in the use of the subconjunctival injection. The greatly harmful results in some cases are but modified in many others. To some extent the essayist has indicated these unpleasant effects. He has not told us of the cyclitis, the panophthalmitis and the sympathetic ophthalmitis which have followed injections made under the strictest aseptic precautions. We must be fair with ourselves and not seek to build up a system of treatment on *cures* alone.

I hope I offend no one by the positive expression of my convictions. The essayist, I am sure, holds the same opinions.

Dr. Moffat: I give my homœopathic medicine hypodermatically whenever that method of administration is the best. Corrosive sublimate may, eventually, prove to be homœopathic to these cases that it cures. We know it has a marked action upon the fundus as well as the iris, even when given by the mouth.

Dr. Deady: In answer to Dr. Copeland, to whose criticism I do not take the slightest exception, I have only to say that my experience does not tally with his. I have formed my views of subconjunctival injuries from observation of fifty or sixty cases. I have never seen a result which was much out of the common, or which caused me any anxiety. I have never seen a case of iritis or cyclitis. Possibly I may have been more careful than some others who have used it; although it is supposed to be always used under the strictest aseptic precautions. If DeWecker uses whole syringefuls with good results and without any untoward results, we should not be afraid of a drop or two. I have never used more than two drops—usually one drop—and the reaction to my mind depends almost entirely on the site of the injection, and whether you happen to strike a nerve or not. The very small sensory nerve it is impossible to avoid, and the pain is more or less severe

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for twenty-four to thirty-six hours. I have only used it in a limited number of diseases, because, as the doctor says in his discussion, we have better means; but there are two conditions, particularly, where I think it is worth a trial: One is in amblyopia with myopia, in which it does its best work, and the other is in choroiditis. These conditions, if we can help them by any means, should have the benefit of a trial of subconjunctival injections because they affect vision very seriously. I have no thought of taking offense at Dr. Copeland's honest opinions. This is not a personal matter. I have simply tried something that has been brought up, and whether it is good or bad is not for me alone to say.

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SECONDARY CATARACT.

By Chas. M. Thomas, M.D.,
Philadelphia.

ANY opacity remaining in the pupillary area after the removal or absorption of the lens, is commonly designated as secondary or after cataract. Even where the lens capsule has been completely emptied of its contents, vision may, with the lapse of time, be interfered with, either by a wrinkling of the remaining capsule or by a gradual opacification of the epithelial cells within its folds. More commonly the secondary opacity will result from retention of some portion of the opaque lens during the operation of extraction, or of clear lens matter which sooner or later becomes opaque. Finally, the pupil may become occupied by membranous deposit, the product of inflammatory action within the capsule itself, or the structures lying in contact with it.

While either one of these causes may be sufficient to the production of secondary cataract, as a matter of fact, a large proportion of cases arise from a combination of all.

The least disturbing form of after-cataract is that found in the first of the above-mentioned classes, and usually does not make itself evident for months, sometimes for years after the extraction. The impairment of vision in these cases is always very gradual and out of proportion to the slight objective changes in the pupil. Indeed, the appearance of the pupil is often so little altered, even after sight has been lowered so that the patient can no longer read ordinary type (say V. $= {}^{20}/_{100}$), that an obstruction can hardly be made out except under very bright illumination; and a very fair view of the fundus can still be had with the ophthalmoscope. On careful inspection the pupil is found to be occupied by a surface not unlike that of watered silk.

When some portion of the lens is left behind after the extraction, the pupil will very soon be seen to be filled with a more or less dense white mass, which may render the immediate result of the operation almost entirely nugatory, and will offer a most discouraging outlook to the patient. Experience, however, shows that if inflammatory complications remain absent, the process of absorption will often bring about in time a most satisfactory clearing of the pupillary space. The

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most troublesome cases are finally those in which during the progress of an iritis or what has been called capsulitis, or both, the pupil becomes occupied by a more or less dense white or pigmented membrane of plastic material, which may show itself promptly after the extraction, or from slowly progressing irido-choroiditis may not develop for many weeks subsequent. Here there can be little or no hope of later improvement by any natural process.

It is thus apparent that, while a certain proportion of secondary cataracts may be looked upon as dependent upon processes beyond our control, a very considerable class will always be found where the opacity might have been prevented or modified by attention to means which will limit the amount of traumatism or inflammatory action accompanying our operative manipulations, and further by so planning our extraction method so as to secure the most perfect clearing of the pupillary space.

The relative frequency of the necessity for secondary operation will certainly be considerably less in proportion to the care which is exercised in carrying out the steps required for securing these ends.

That the discussion of the question of avoidance of conditions liable to entail the necessity for subsequent operation interference is a matter of much importance goes I think, without saying even though the risk attending the secondary operation were less than that acknowledged by those who have the largest experience therein, and those therefore who might be expected to have the best results from its performance.

One of the first requisites for securing complete removal of the lens from its capsule is that the opacity shall be as nearly as possible complete, that is, that the cataract be ripe.

While I do not believe that one should invariably wait for extraction till no transparent cortex can be seen, till the patient can no longer see objects, and there is no red reflex to be made out with the ophthalmoscope, I am nevertheless inclined to think that many of us are too much disposed to operate before the cataract is quite ripe and this, either from inattention, or perhaps a desire to secure the case, or a lack of firmness in resisting the appeals of the patient. In at least the ordinary cortical variety we should certainly make sure that the opacity is complete before extracting, either by patiently waiting out the time for entire ripening, or by resorting to one of the operative methods for hastening maturity.

While there may be some risks in the artificial ripening, my experience, mainly with the Foerster method lead me to believe that they

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are far less than those met with in attempting to extract immature cataracts particularly of the cortical variety; and the results, while not always so prompt or certain as one would desire are occasionally most brilliant in shortening the trying period of waiting.

In the purely so-called nuclear cataract occurring in people well advanced in life, the process of opacification we know will often go on slowly for many years; the cortex becoming hard or sclerosed without actually losing its transparency, while the large opaque nucleus filling the greater part of the pupil, obstructs vision almost as effectually as a ripe cataract. In such cases although the fundus is perhaps visible, we need not postpone interference till the ripening is complete, for with a generous section, the delivery can commonly be made surprisingly clean on account of the tough cohesive character of the cortex.

I have long been fully convinced, that one of the most important factors in not only securing a pupil free of cortical remains, but probably also in lessening the risk of plastic inflammatory action, lies in the performance of a preparatory iridectomy.

Supposing this to be done, I cannot conceive of a more simple, safe and complete operation than the removal of cataract.

The manipulative steps are certainly thereby reduced to the minimum—*viz.*, section of cornea, section of capsule, and expulsion of lens. The iris is hardly an element to be considered, it is never in the way of the knife, it need neither be cut nor bruised, and practically never prolapses. The iridectomy need never be done under unfavorable conditions (hours or days after extracting) and finally the intanglement of the iris with its various risks need never be given a thought. The steps of the capsulotomy and delivery of the lens may certainly be conducted with greater ease and precision, there being no bleeding to obstruct the view, as is so often the case with immediate iridectomy, and no necessity for groping under the iris with the cystotome as in the so-called simple extraction. The only important obstacle to the expulsion of the lens has been removed, and the coloboma furnishes a free road-way, not only for clearing away cortical remains, but, if desired, for the introduction of irrigation instruments.

As further contributing toward the prevention of secondary cataract, I think we should include certain points in the operative technic, and, by limiting the traumatism, reduce the risk of formation of inflammatory pupillary deposits.

Foremost among these is the placing of a generous section of the cornea. When the corneal incision is limited, the natural inclination is

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to force the delivery through the insufficient opening at the risk of scraping off cortex and leaving it in the anterior chamber, rather than attempt the somewhat awkward manœuver of enlarging the section after the lens has started into the opening.

A careless or insufficient capsulotomy will often not only add materially to the traumatism by necessitating harmful pressure and manipulation in delivery but will invariably result in retention of more or less cortex between the capsular layers. While in my earlier experience I opened the capsule at the periphery, I have of late years satisfied myself that the most complete clearing of the pupil is accomplished by starting the capsulotomy with a vertical cut from well below the centre or axis of the lens, and ending at the equator and finishing by a free horizontal cut at the equator following the line of the corneal wound. Whenever there is the slightest tardiness in the movement of the lens through the section I add to the pressure of the spoon from below, a backward pressure on the sclerotic lip of the wound, and have the assistant, prepared to lift the lens through by gently sinking a sharp hook into the nucleus. Absolute quiet of the patient and of the eye during the first days of healing must certainly add their influence in securing freedom for inflammatory pupillary deposits; and this it seems to me is much more surely accomplished by previous iridectomy, which does away with all necessity for replacing or excision of iris prolapse, perhaps under the disturbing effect of a general anæsthetic.

Finally, after the healing process is complete, it is, I think, an important question as to whether we do not often favor the development of pupillary opacities by too early an adjustment of the glasses and the use of the eyes. I am in the habit of continuing the use of the mydriatic for two or three weeks after the patient is discharged, and when possible, make no correction of the refraction for from four to six weeks after the healing.

Of the immediate division of the posterior capsule at the time of the extraction as a preventive measure. I can say nothing having had no experience with it, nor have I seen a case in which it had been done. Personally, on theoretical grounds, I should think its risks from vitreous prolapse and infection greater than those attending the secondary operation, and so far as I know, the expectation that it would remove the necessity for subsequent capsulotomy has not been realized.

I have ventured to consider rather at length some of the means by which the frequency of secondary cataract may be lessened, believing as I do that we can never be justified in looking upon even the least of

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the operations which we are accustomed to do for its relief, in the light of a trifling or harmless procedure; though I cannot accept the statement of Wecker and others that the discission is an operation of greater gravity than that for extraction of the lens. On the other hand, I would be quite as unwilling to follow the practice of even so great an authority as Knapp who does not hesitate to operate for the improvement of a $^{20}/_{40}$ vision.

While in a general way, the risk of operation is greatest in dense membranes, and more particularly when they have followed iritic or irido-cyclitic processes, we have to bear in mind that fatal glaucoma and panophthalmitis have been known to result from the simple needling of very innocent appearing thin membranes. Although the percentage of these evil results is small, I question whether we are justified, unless under exceptional conditions, in risking such a misfortune, when the visual power already obtained is as good as say $^{20}/_{50}$ or $^{20}/_{70}$ with the ability to read ordinary print with fair ease.

In considering the question of operation, I will premise by saying that *cet par* a needling may be undertaken at any time after the subsidence of the irritation following extraction, and after the time at which we expect patients to attain their greatest visual acuity say 4 to 6 weeks.

The age of the membrane counts but little in the prognosis, provided its formation has not been the result of an iritis or irido-cyclitis. The amount and character of such complicating inflammation necessitating a greater or less variation in the operative technic.

It may be said in general that the same care and precautions are required as to asepsis, etc., in the operation for secondary as in that for primary cataract, even when it consists only in the mere needling of a non-inflammatory opalescent wrinkled capsule.

The larger the pupillary space, the more readily can the operative manipulations be carried out, hence, when the iris is not extensively attached to the capsule the pupil should be well dilated for some hours previous to the operation. Here again a pupil with a moderate coloboma often presents a distinct advantage over the central round pupil of the simple extraction, especially when adhesions are not entirely absent.

An enumeration of the various operations for secondary cataract or a detailed descriptian of technic would be superfluous before this society and I shall therefore limit myself to a brief and rather personal consideration of the subject.

If there be a moderately large pupil, and the membrane is apparently

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not very thick or dense, or even in the latter case, if there are thinner portions so located as to justify it, I think there can be no question that the method to be preferred above all others, is that which has been so extensively practiced, and so often described at length by Knapp—*viz.*, the cutting not tearing, of the membrane by means of a straight delicate knife needle.

Too great care cannot be exercised in illuminating the anterior chamber, particularly if the membrane be thin; and as a rule the light will come best from a point opposite the operator and from the side toward which the needle points.

The lids should be kept closed for some minutes just before the operation, as, specially where cocaine has been freely used, the steps of the capsulotomy may be annoyingly obscured by a sudden dulling of the corneal epithelium. I always also flood the front of the ball with pure water just as the needle is introduced.

The direction to enter the needle not farther than 3 mm. from the edge of the cornea, is most important, as the nearer the puncture lies to the centre of the cornea, the more difficult it is to make a sufficiently long clean capsular cut. Further, I believe it should always be introduced at the temporal edge of the cornea, otherwise the bridge of the nose may interfere with depressing the handle in tilting the point of needle towards the corner in passing from the horizontal cut to the vertical ones.

Finally as to the shape of the incision, I have to confess that I have often found it difficult to make it a crucial one, owing to the shallowing of the anterior chamber from loss of aqueous before the third cut could be made; and as a matter of fact, a T incision is commonly all sufficient.

When the membrane is not readily cut by the single needle, I believe one will rarely do better by attempting to tear it with the double needles of Bowman.

In all dense membranes, and those of inflammatory origin, operative measures should be approached with great caution and only after the eye is perfectly quiet, and particularly should methods be avoided which will cause traction on the iris and ciliary body.

When one is in doubt and fails to cut with the needle on moderate effort, it is surely much better practice to open the anterior chamber and divide the membrane with the Wecker scissors or draw out a portion and abscise it as advised by Knapp.

Any of the disastrous or unpleasant reactive processes which follow

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the primary operation, may attend the secondary, though their occurrence in these days of aseptic surgery must be rare. Irido-cyclitis, irido-choroiditis and destructive suppuration have very occasionally been reported; personally I have no knowledge of them.

"Glaucoma," in the words of Knapp, "is the only consequence of discission which may be fairly considered as inherent to the operative procedure."

This unpleasant sequel I have met with twice in my own practice and though I was fortunately able to control it in both cases by free use of myotics alone. I believe that the latest words of Knapp on this subject, *viz.*, "All cases of ever so slight glaucomatous cyclitis should be treated with iridectomy without delay" are deserving of most serious attention.

DISCUSSION.

Dr. J. H. Buffum: In the reading of Dr. Thomas' paper I am struck with the coincidence of his experience in secondary cataract with that of my own and I should have been pleased on that account to have had the principal discussion of his paper fall to some of our colleagues whose experience may have been different from that of either Dr. Thomas or myself.

The various forms of secondary cataract and their causes have been fully described in the paper before you. There is no doubt that the early operation for cataract is the cause of a large percentage of subsequent opacity of the capsule, and it is undoubtedly true that a much greater need for secondary operation in the last few years is due to the fact, that we do not time our primary operation, as well as we did ten years ago.

The advancement of ophthalmic surgery which has kept pace with rapid strides in general surgery and enables us to obtain better and surer results than before, has however tended at least to lessen our conservatism, and perhaps to affect our judgment as to the best time for the primary operation.

It is true the demands of patients for early operation as well as the fact that there are many operators who encourage the laity to believe that cataract can be operated upon at any time after vision has begun to fail, sometimes causes us to make an operation earlier than we otherwise would.

It is a fact that a cataract may be ripe for operation and yet not opaque throughout and may bring at times a brilliant result to one who undertakes the operation but subsequent operations based upon a case of this kind, are usually fraught with loss of the eye or vision to the patient and of reputation for judgment or skill of the operator.

A careful study of cases which show an individual tendency to

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sclerosis of the lens fibres as evinced by the condition of the other tissues of the eye is necessary to form a proper opinion as to time of operation to obtain the best results.

As to the best method of operation for cataract for the avoidance of the necessity of a secondary operation, it is impossible for any surgeon to say, each operator is inclined to think his own is the best and so it should be if he gives to his cases the careful analysis he should and finds his results as satisfactory as that of others. Our patient's expectation is vision and is unable to appreciate the brilliancy of our operation if it leaves him more blind than he was before it. To this end nothing contributes more than a preliminary iridectomy which may be made at any time after the opacity has become marked and which in my own experience is the best ripener of immature cataract. Its objections have been thoroughly discussed but the advantages are obvious. A full capsulotomy is without question of the greatest importance. The use of atropine with cocaine for three or four weeks after the operation is in my experience a valuable aid in the prevention of capsular opacity and I fully agree with Dr. Thomas that the time for the fitting of lenses should be delayed until the eye has fully recovered from the operation. In the majority of cases I believe six to eight weeks should elapse between the extraction of the cataract and the use of corrective lenses. I have never thought it was wise to perforate the posterior capsule at the time of operation. As to the time when a discission should be made for secondary cataract my experience has been that better results are obtained by waiting four months, than making what would seem a simple operation at two months when the patient has a vision of $^{20}/_{70}$ or $^{20}/_{50}$. With vision of that value the puncture of the posterior capsule may or may not give our patient better vision.

As Dr. Thomas states, simple as the operation may appear, there is a certain element of danger to the already existing vision and in many cases the condition of the fundus of which we may have had no knowledge, may preclude the possibility of obtaining better vision and again be such as to be readily incited to take on an inflammatory process which will destroy the good results obtained by the primary operation.

The reaction following the operation is usually trifling but after a few days a glaucomatous condition is not infrequently set up and demands the immediate use of myotics or the performance of an iridectomy and when the condition is recognized at once and the proper treatment applied the vision is often saved.

Dr. Anderson: This is a very important paper. There are one or two questions I would like to ask Dr. Thomas, and one is, why he thinks atropine necessary after the operation to dilate the pupil, where there is no sign of any iritic trouble? I formerly did it, until, in several cases, I got acute mania, as I thought, as the result of atropine, and unless there are indications of iritic trouble I do not use any mydriatic. My last experience was with a woman 95 years old, from whom I had successfully removed a cataract. In a moment of haste I gave her a weak solution of atropine which brought on glaucoma and she lost the

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use of the eye. I do not believe in the use of atropine where it is not necessary, and I do not believe it is necessary unless there is some sign of iritis.

Dr. Vilas: I do not think a paper as valuable as this should be passed over in a light manner. No paper presented here to-day is more entitled to careful consideration; and there are no subjects more interesting to those operating much. I was particularly impressed with the conclusions in regard to his operating, and I could say much in cordial approval. His remarks in regard to the capsulotomy were excellent. The opening of the capsule has been a subject discussed in a voluminous way; but, after all, the way to open it, as I believe, is the way that the author of the paper prefers. I suffered in my early practice from fear of something that was going to happen about the time that I opened the capsule, but I never saw bad results when it was opened properly. I think the various devices that have been invented have nearly all been abandoned for the method described so carefully in the paper.

The second point was regarding the needling operation. I was not aware of the danger of this operation until I had done it so many times that I was beyond fear. I never saw serious results, and I never hesitate to needle any case which has yielded unsatisfactory results; and by unsatisfactory results I mean where the patient has been unable to read. It has not always happened that a person has been able to read after needling; but I have seen no unfavorable results from this operation, and I believe that the reason is that I have used needles that have been sharp so there has been clean cutting, without any dragging on the tissues. I do not use an ordinary needle, but a knife needle.

My third point is with reference to the use of atropine. I use it as Dr. Thomas does, and have never seen any serious results follow from its use.

Dr. Norton: I would like to endorse what has already been stated about the value of this paper. The reason that so little discussion can be had upon this paper is because there is no room for discussion: the subject has been so well and thoroughly covered. Not having had as an extended experience as the author of the paper, and having so far met with but one unfortunate experience from discission, I do not look upon the operation with the same caution. From my own experience I should not feel as if I had done my full duty to my patient with no better vision than $^{20}/_{50}$, did I not advise a needling operation. I have always used the Knapp knife needle and the only complication ever met with was in one case in which I had, following the operation, a panophthalmitis and lost the eye. I presume I have made the needle operation hundreds of times and have never seen any bad result whatever except in this one particular instance. This was a case in which the extraction had been made by another. There was a very dense capsule remaining and evidently no discission had been made. The operation was made with Knapp's capsulotomy knife in the usual manner. I can conceive of no

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reason why the eye should have been lost except, possibly, as the capsule was very dense and tough and the first knife did not seem to cut well, I used a second knife, which I called for in a hurry, and it may not have been sterilized before insertion. That is the only assignable reason I could give for losing the eye; but, with the exception of that one instance, out of hundreds of discissions I have never seen any bad results. In my opinion the operation is not as frequently made as it should be.

Dr. Hasbrouck: I wish to thank Drs. Thomas and Vilas, who have spoken on this subject, as I believe with Dr. Thomas that the preliminary iridectomy is the only safe and true operation in cataract extraction. I have operated with the simple operation and with iridectomy at the time of the operation; but I never forget the words of Dr. Story, of St. Mark's Hospital, when he said that if he had a cataract of his own, he would never have it operated on without a preliminary iridectomy. The needle operations I have done many times, and never but once have seen any bad results. That time I had glaucoma follow in four or five days. There had been no immediate irritation apparently the first two or three days after the operation and the eye did well but the case developed glaucoma; and, even though I did an iridectomy almost immediately, she lost the sight. I operated upon the other eye later for cataract, and also needled this second eye but with no bad result. There were no apparent inflammatory results to make me think I had poisoned the eye, and why glaucoma occurred in that case I could never tell. In the glaucomatous condition the local irritation was slight, but the tension went up and the pain increased. I did the iridectomy right opposite to the one I had previously made. I don't think in this case that atropine had been used. I now prefer using atropine from the beginning but at that time I was one who did not believe in atropine after an operation until necessary, but I have changed my mind and now always use atropine in the manner Dr. Thomas advocates.

There is one other instrument I have not heard mentioned here and have not seen except once or twice in the hands of doctors in this country—that is, Ferguson's scissors for the very tough capsules which we do not succeed in cutting with our needles. They look like DeWecker's scissors, but the cutting edge is on the outside and they cut from within outwards so there is no strain upon the ciliary region. I have seen them, in cases where there has been an exudative iritis, do splendid work, where the pupil was all closed after an operation. It is an instrument that you should all have.

Dr. Suffa: My attention was first called to an ingenious intraocular scissors, invented by a Dr. Prentice, I think, and made by Geo. Teimann & Co. These scissors have blades that c ut both on the outer and inner edges, and are introduced through the cornea closed, making their own puncture, rather than an incision, and are of a size to close the opening made in the cornea, thus preventing any loss of aqueous. When the blades are in the anterior chamber they are opened, one blade penetrating and passing beneath the thickened capsule, the other blade passing above the capsule, and, when closed, making an incision in the

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capsule as well as dividing the iris if necessary. I had occasion to use these scissors in one case following an iritis, after a tardy closure of the cornea, where the iris was nipped in the lips of the wound, and drawn upward, leaving a shallow anterior chamber, and dense capsule to which the iris was adherent. The anterior chamber being shallow, leaving barely room to manipulate the blades, made this a difficult case for this instrument; yet one snip of the scissors divided the capsule and part of the iris, giving a clear pupil.

I consider the instrument a valuable one, and the operation far preferable to the one requiring DeWecker's intra-ocular scissors, being no more difficult of execution, and with far less danger of loss of vitreous and a smaller corneal cut to heal.

Dr. Hasbrouck: The scissors I speak of were made by Tiemann & Co. Dr. Ferguson is from New Zealand. I knew him in London, and have always been interested in his work. I saw the description of the scissors in the *Ophthalmological Review.*

Dr. Thomas: In reply to the question of Dr. Anderson in reference to the use of atropine I would say that I consider its employment imperative after extraction, on account of the disposition for iritis to appear (even after clean operations) between the third and ninth day, and sometimes as late as the fourteenth. As to the intimation that atropine should be withheld until symptoms of iritis present, I can only say that in my experience extensive iritic adhesions and plastic deposits will occasionally occur, entirely without symptoms—that is, as the result of the so-called "quiet iritis."

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SEPTIC THROMBOSIS OF THE LATERAL SINUS SECONDARY TO PURULENT OTITIS MEDIA.

By Dudley Wright, F.R.C.S.,
London, Eng.

THROMBOSIS of the cranial sinuses is of two kinds. The first, or non-inflammatory type, which occurs in patients suffering from marasmus or other wasting diseases scarcely concerns the surgeon. The second, the infective inflammatory form, is of the greatest importance, for prompt action based upon a knowledge of the nature of the disease and of the parts involved will enable us to save many a patient from certain death.

It is impossible to enter fully into the pathology of the complaint in this paper, suffice it to say that, of all the sinuses, the lateral is the one most frequently affected, the exciting cause being suppuration in the middle ear.

In such a case the organisms invade the sinus and cause disintegration of its endothelial lining. This eventually leads to thrombosis and the clot may then undergo organization which finally leads to the obliteration of the sinus; or, as more commonly happens, the clot breaks down into a suppurating mass, loaded with septic organism, gets washed into the general circulation, and sets up a fatal pyæmia. An inflammatory fluid, which eventually becomes purulent, usually collects around the inflamed sinus, and forms a sub-dural abscess.

The symptoms of this affection have been dealt with in a masterly manner by Macewen in his work on "Pyogenic Diseases of the Brain and Spinal Cord." He divides them into two groups, viz., general symptoms, and local ones, which are determined by the anatomical position of the sinus affected.

The general symptoms are; headache which may be generalized or only over the part affected: vomiting; very rapid pulse; temperature of a remittent type, and very often rigors. According to his experience the symptoms take on a more or less definitive form, such as (1) the pulmonary, in which after the disease has existed a week or two lung signs, such as dyspnœa and stabbing pain in the chest, possibly due to infarctions, occur. Secondly, the *typhoid* type, in which, at the end of the second week, there is abdominal pain, meteorism, and diarrhœa;

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the stools often being pea-soupy and very offensive. A dark measly rash not raised above the surface, nor disappearing on pressure may also occur. And, thirdly, the *meningeal* form, in which symptoms of meningitis are present.

The local symptoms vary according to the sinus affected. In the case of the longitudinal sinus, œdema of the scalp, swollen veins in the occipital and frontal regions, epistaxis owing to venous circulation in the nose and convulsions followed by coma and death usually complete the picture. In the case of the cavernous sinus, exophthalmos, and œdema of the lids and surrounding parts together with ptosis and squinting are present.

If the lateral sinus is involved, swelling and tenderness along the course of the internal jugular vein, with enlarged cervical glands, may be found. Œdema over the mastoid is often present, it is, however, a mistake to suppose that this always accompanies the sinus disease, or even is present in every case of mastoiditis, for one of the narrated cases will show, both present without any mastoid dwelling.

If the clot breaks down, or becomes puriform, micro-organisms are carried on by the circulation into the lung, and pyæmic abscesses are set up at the site of the lodgment of each particle of thrombus. It is only by as early recognition of the nature of the case, and prompt and energetic treatment that such an accident, usually fatal in its result can be avoided.

In dealing with these cases it should be our aim first of all to render healthy those parts which are the *fontes et origines* of the disease. That is to say the mastoid cells and antrum and the middle ear must be thoroughly attended to. This having been done, the next thing is to open up the groove which lodges the lateral sinus. This can be easily effected by removing some of the bone behind the original opening into the mastoid antrum.

The sinus having been laid bare, we must note whether its normal pulsations are present or not. These pulsations are most marked with each act of respiration, but arterial pulsations are also communicated to it. If no pulsation be present we may suspect that it contains a thrombus, though this is not a certain sign of clot. We may make sure of the presence of thrombus by inserting a hypodermic needle—needless to say, previously sterilized. If we now aspirate, we may obtain no result, or a puriform clot may come away. In many cases, where the clot is septic, and often before it has broken down within the sinus, a collection of matter will have formed around the sinus, or even, as in the

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second case narrated, gas may have formed and escape on removing the bone. In any case, where we have ascertained the presence of a clot, and where symptoms of septicæmia are present, and more particularly if pyæmic symptoms are noted, I deem it by far the best treatment to immediately ligate the internal jugular vein in the midlle of the neck, or lower if the clot be found to have extended lower, and then to open the sinus freely and remove the infective material that lies within.

I much regret that I did not do this with the first case; but it occurred so long ago as 1891, and in those days this operation was scarcely introduced. In the second case occurring in 1894 I proceeded as above, and with a successful result; though the patient passed through a very anxious period before we were sure of her recovery. Since that time I have operated upon many scores of mastoid cases, but I have not been called upon to deal with any presenting signs of sinus thrombosis. I believe this points to the fact that the profession as a whole are more alive to the baneful results of neglected mastoiditis, and are careful to apply to the surgeon early whenever mastoid symptoms arise in the course of an otorrhœa.

Case One.—Florence F., aged 12, first seen on October 20, 1891, was at that time complaining of severe pain around the right ear, radiating over the whole right temporal region; slight, offensive, brown-colored discharge from the ear, and general feelings of malaise. The discharge had been present three years; one year ago the patient had an attack of scarlet fever, after which the discharge slightly increased.

The pain came on for the first time three days ago; two days ago the patient vomited once and had a slight fit, but nothing definite was noticed about it beyond that the arms "twitched" a great deal, and that there was no loss of consciousness. On the day that she was first seen the temperature was 101.6°. The mind was quite clear, though the child was evidently suffering great pain. Skin dry, and tongue coated; pupils equal. There was no redness or œdema over the mastoid process, but this and the right temporal region were tender to pressure.

The next day, October 21st, the patient was admitted to the hospital, the above symptoms remaining about the same. Examination of the meatus showed it filled by florid granulations, which completely obscured all view of the drum, and bled readily when touched with a probe.

In spite of treatment the patient grew rapidly worse. The pain increased; the temperature varied between 103° and 99.6°; the pulse became very frequent, at times reaching 150 per minute; there was great restlessness; the patient grew dull and was constantly sighing and moaning involuntarily; and there was photophobia. Ophthalmic examination revealed a commencing double optic neuritis.

On the third day after admission (October 24) the mastoid antrum

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was opened by means of a small trephine. About a drachm of fœtid pus was removed, and the granulations and polypi were removed by means of a curette. Iodoform emulsion (glycerine and iodoform) was then instilled through the mastoid wound, and a drainage-tube and iodoform gauze-dressing applied.

The operation had the effect of relieving the pain for about twenty-four hours. There was a free discharge from the wound, necessitating a change of dressing twice daily. The pulse, however, did not diminish in frequency, and the temperature showed oscillations.

On the morning of the 26th, the patient had a rigor, and the pain returned, and the optic neuritis was found to have increased. A consultation was held, and it was decided to explore the brain for an abscess. The spot selected for trephining was 1¼ inches behind the center of the meatus, and 1¼ inches above Reid's "base-line" (a line prolonged backwards from the lower and outer angle of orbit through the center of the bony meatus). At this spot a ¼-inch trephine was applied, the bone removed, and dura mater incised. An aspirating needle was then passed into the underlying temporal lobe in various directions, but no pus was found. The wound was, therefore, closed. A few small pieces of the bone removed were replaced, and the usual dressings applied, the pericranium and the skin-flaps being sutured separately.

The patient recovered well from the immediate effects, and passed a good night, the temperature having fallen considerably, but the following day the symptoms returned, and the patient grew rapidly worse, being at times unconscious, and having daily rigors up to the 29th, the temperature on one occasion rising as high as 107.°

At midnight on the 29th it was decided, as a last resort, to explore the surroundings of the lateral sinus. To effect this, an incision was made at right angles to the previous mastoid wound, and the bone removed just behind the mastoid process with a chisel, until the sinus was brought to view, and a further enlargement of the opening was then made with bone forceps. A probe passed backwards, separating the sinus from the bony groove, gave exit to fœtid pus. This was done several times, both upwards and backwards, and in the direction of the superior petrosal sinus, and along the posterior surface of the petrous bone; and weak carbolic solution used to wash away the pus, which came away in fair quantity. The lateral sinus pulsated, and therefore appeared to have fluid contents, but it was not opened to ascertain this. The walls were rough, and covered in parts with inflammatory lymph.

The temperature fell to 97° after the operation, and during the next day did not rise above 102°. The following day—October 30—the patient had another rigor. Temperature 102.4°. The general condition was fair. The wounds looked fairly healthy, and the discharge had entirely lost its offensive character. The patient suffered no pain, and slept and took food well. Dressings were renewed twice a day, and the antiseptic lotion was syringed for a considerable distance beneath the dura mater.

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On November 1st the patient became worse. A cough developed, and she had pain in the left side of the chest, where a distinct friction sound was heard. This continued, and the strength gradually failed, and temperature fell, on one occasion going as low as 95.2°, and finally the patient died, on November 5th, a week after the last operation. *Bryonia, China, Aconite,* and *Lachesis* were all used during the progress of the case, but without avail.

At the autopsy, extensive thrombosis of the lateral sinus of the right side was found, the clot extending downwards in the internal jugular vein as far as the level of cricoid cartilage, and upwards as far as the torcular herophili. The veins leading from the lateral and petrosal sinuses were extensively thrombosed. There was no abscess in any part of the brain, and no appreciable meningitis.

The roof of the mastoid antrum was necrosed and carious, and the ulceration had spread up to the petro-squamous fissure, thus effecting a communication between the tympanum and the sub-dural space.

A septic infarct was found in the right lung, the left lung was collapsed, and the pleural cavity contained about ℥i. of pus. The other organs were fairly healthy. The trephine wound over the tempero-sphenoidal lobe had entirely healed up.

Criticising this case in the light afforded by the post-mortem examination, we are able to follow the train of events which led to the fatal issue, and, at the same time, can form a fair conclusion concerning the most suitable treatment.

We see that a chronic inflammatory disease, apparently originating in the tympanic cavity, had caused a carious process to be set up in a localized part of the surrounding bone, effecting thereby a communication with the extra-dural space situated over the upper surface of the petrous bone.

This having taken place, the pus, in time, found an exit, and having, we may presume, collected to a certain extent at this spot, gravitated towards the sulcus lateralis on account of the normal incline downwards and backwards of the upper surface of the bone.

Having once reached this situation it found a convenient resting-place for itself, and, at the same time, set up an inflammation of the coats of the adjacent sinus, which probably soon exerted its injurious effects upon the blood contained within.

It was at about this stage that the case came under treatment. The almost hourly fluctuations of the temperature were an index of the extent to which the blood was being poisoned by the absorption of the accumulated septic products, and the pain, optic neuritis, and frequent pulse denoted the meningitic irritation. The mastoid was now opened, and the release of the pent up pus, together with the depletion of the

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vascular turgescence, effected by the loss of blood during the operation resulted in a temporary amelioration of the symptoms. The most important seat of the disease, however, remained untouched, and, therefore, further complications ensued; the sudden appearance of rigors probably betokening the occurrence of secondary septic inflammation in other regions and development of a pyæmic state.

Case Two.—Sarah C., aged nine years, was admitted into the London Homœopathic Hospital on January 27, 1894, suffering from intense pain behind the left ear and swelling in the neck below the left mastoid process.

The patient had scarlet fever two years ago, followed by a bad-smelling discharge from the left ear, which had continued up to about three months ago. Three days before admission, the pain in the head first came on; it rapidly increased in severity, and the night before admission the patient was delirious. There had been no rigors or convulsions.

On Admission.—The child was very pale and cold and almost collapsed. Pulse 136 and temperature 100°. She was deaf in the left ear and had some swelling of the tissues below the mastoid process, and there was tenderness to pressure there, but there was no redness of the skin and no swelling whatever of the mastoid itself.

There were no abnormal physical signs in the lungs or heart. Was ordered *Belladonna* and *Plantago*. On the day after admission (28th) the patient vomited three times and was still in great pain, the temperature varying between 101° and 102.8°. *Veratrum viride* lx. On the 29th January there was marked drowsiness; the patient was continually lying on her left side, with the knees drawn up. Pain and tenderness over the mastoid region remained about the same, and the swelling in the neck was still present, but there was no redness or swelling over the mastoid itself. The knee-jerks were absent, no ankle clonus, pupils dilated. Ophthalmoscopic examination, made by Mr. Knox Shaw, showed the discs swollen and edges indistinct but not striated and considerable congestion of the vessels. Examination of the ear showed a perforation in the drum, through which some thin offensive pus was discharging.

A consultation was held, and it was decided that an exploratory operation was advisable. The patient was put under the influence of A.C.E. mixture, and an incision was made behind the ear and the bone covering the mastoid antrum, was removed with a chisel and forceps, the lining of the posterior wall of the external meatus being detached and held forward. A considerable thickness of bone was removed before the antrum was opened and the fœtid pus which it contained then escaped. Finally the opening was much enlarged by removal of the greater part of the mastoid process, and the cavity well scraped out and flushed with antiseptic lotion and packed with iodoform gauze. At the close of the operation some air of fœtid odor was noticed escaping

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from a small opening in the posterior part of the cavity. The patient was rather collapsed after the operation.

On the next day (January 30th) the following notes were made:

"The patient had some pain in the night and vomited once. This morning the patient had a rigor, the temperature going up to 105.4. The dressing was changed, a fair amount of discharge having come away. Hot boracic fomentations to the ear had given considerable ease to the pain, and the patient seemed better in the afternoon after the rigor."

The occurrence of a rigor in spite of the exit already given to the pus pent up in the mastoid antrum, made it highly probable that septic matter was present around the lateral sinus. It was, therefore, deemed advisable to open up the sulcus lateralis. This was accordingly done under an anæsthetic the same afternoon.

By prolonging backwards the incision made on the previous day, the bone was laid bare and removed, and the lateral sinus exposed. It was found covered by a thick layer of adherent pyogenic membrane. This was removed, and a hypodermic syringe used to ascertain whether the sinus contained fluid blood. None was, however, obtained, it being evident that the venous channel was obstructed by a thrombus. The wound was accordingly temporarily plugged with gauze, and an incision was made along the anterior border of the sterno-mastoid at about the middle of its length. The external jugular, which lay in the line of the incision, was divided between two forceps, and a mass of enlarged glands removed, the internal jugular being thereby brought to view. It was found to contain clot as far down as the entrance of the middle thyroid veins, and a double ligature was placed around the vein below the lower extremity of the thrombus, and the vein divided between the ligatures. The lower extremity of the upper divided end was then opened, and stitched to the skin, and some of the contained clot removed. The lateral sinus was next opened, and clot mixed with pus removed from it, both from its lower and upper part, whereupon free hæmorrhage took place. This was easily controlled by plugging with gauze, and the usual dressings completed the operation.

The pulse was rather weak towards the end of the operation, but was much improved by an enema and hypodermic injection, of brandy.

The patient rallied well and slept a good deal through the evening and night, and the pain was much less. Liquid food was taken well, together with small doses of brandy. Three doses of *Strophanthus* lx were also given during the night. The temperature varied during the following two days between normal and 102.8°. The dressings were changed daily and a stream of lotion made to wash out the vein from its upper to its lower opening, thus removing the septic coagulum.

On February 2d (the third day after the operation) the patient complained of pain in the left side and the respirations were accelerated. A loud pleuritic rub was heard in the infra-axillary region. (*Bryonia* lx ordered.)

The following day impaired resonance and harsh breathing was

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found at the left apex in front; and at the base the percussion note was dull below the angle of scapula, and tubular breathing was present here. The friction sound was not so loud as before. *Phosphorus.*

On February 4th the left lung remained about in the same condition, but the harsh breathing was present at the right base. The head and neck wounds were progressing well, the discharge having lost its offensive character, and healthy granulations appearing.

On February 7th the whole of the left base was dull to percussion with weak breath sounds. Above the angle of scapula there was ægophony. Aspiration of the pleura with a hypodermic syringe gave a negative result.

There was a small slough in the neck wound, which together with the stitches uniting the vein to the skin was removed. The patient had been taking food and brandy well. There was only a slight cough and no expectoration.

On February 9th expectoration had appeared in the form of slightly fœtid yellowish lumps. There were signs of redux crepitation at the right apex, and considerable dulness at both bases.

The dulness at the left base had considerably diminished by the 14th of February, and small crepitations were heard at the right base; there was also impaired resonance and harsh breathing at the right apex. Since the last note on the temperature the daily variations had been considerable, the maximum being 104.4° (on one occasion) and the minimum 97°. (*Arsenicum iod.* 3x.)

February 19th.—Since the last note the temperature has been falling steadily, and during the last two days it has not risen above 99°. Left lung is clearing well. In the right lung crepitations are heard as high as the mid-scapular line. Expectorations of yellowish offensive sputum continue. Both wounds are closing, though there is some purulent discharge from the left ear.

February 26th.—The patient is improving rapidly. The dulness is disappearing from the bases, and the patient is sitting up in bed and appears much stronger. The temperature keeps normal, and expectoration has now nearly ceased.

March 12th.—The patient has now been getting up every day for the last ten days, and is in very good health, though still somewhat anæmic. There is only a very small wound behind the mastoid and the neck wound has healed. The temperature remains normal. There is still a slight discharge from the ear.

Shortly after this date the patient was discharged from the Hospital quite well, and went to a convalescent home. She has lately been seen, five years since the operation, and is quite healthy, the ear never having given her trouble since she left the hospital.

DISCUSSION.

Dr. George W. McDowell: The recital of the two cases of sinus thrombosis to which we have just listened are exceeding instructive.

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The first shows the almost inevitable result when the condition is not recognized, or when operative measures are undertaken too late to prevent secondary infection of remote organs. The second illustrates the triumph of modern surgical methods when applied in time, in averting what would otherwise be a fatal termination of the disease in question.

Certainly no blame can attach to Dr. Wright's failure in the first instance to reach the site of infection, by opening the lateral sinus, as was done in the second, for at the time of the first operation eight years ago, but little was known on this subject. Burnett, in his edition of 1884, does not even mention the lateral sinus, of so little interest was it to aurists of that day. Politzer, in his edition of 1894, the year of Dr. Wright's second case, says: "The prognosis of otitic-sinus diseases was very unfavorable until within a short time, but owing to the great progress of modern surgery it has proved more favorable in so far, that results have been obtained by the operative treatment which were scarcely anticipated a few years ago."

The question of diagnosis of sinus thrombosis is of the greatest importance to every aurist, and is not as yet absolutely settled. One of the most important symptoms for diagnostic purposes is the temperature curve, which may show great variations from hour to hour, reaching 104° to 106° and then dropping to nearly normal spontaneously. The sudden rises of temperature are thought to be due to the passage into the general circulation of septic material, which is thrown off by the breaking down of the disorganized clot in the sinus. In order to detect these sudden changes, the temperature should be taken every two hours when such a condition is suspected. Another characteristic symptom is the presence of rigors in a patient suffering from mastoid disease. This, however, is not always present, but when it exists, is almost pathognomonic. In some of the cases when the thrombus extends into the internal jugular vein the latter may be felt like a tense cord running along the anterior border of the sterno-cleido-mastoid muscle. In the second case reported this probably could not be felt, as the author states that a mass of enlarged glands had to be removed before the internal jugular was reached.

There has been some difference of opinion among operators as to whether it is necessary to ligate the vein before the sinus is opened. Some have claimed to have attained as good results when they have left the jugular untouched as when it was ligated, getting more or less secondary infection in either case. The method adopted by Dr. Wright in his second case, in which he cut the jugular between the two ligatures, slit the upper portion to remove the clot, and then sutured it to the skin, thus permitting a thorough cleansing of the sinus from above downward, is certainly to be commended. The successful outcome of the case, in spite of the secondary infection which existed at the time of the operation, is a matter for congratulation, and will afford hope to others under similar circumstances.

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THE TREATMENT OF TRICHIASIS.

By E. W. Beebe, M.D.,
Milwaukee.

THE affection of the eyelids known as trichiasis, and upon which I have the honor to report upon this occasion, is seldom seen in such severity as formerly, when trachomatous disease was more prevalent, yet the milder cases are encountered sufficiently often to make the subject of more or less interest to the surgeon.

It is a topic which, from its fancied simplicity, is seldom discussed by an association of this character, and I feel like apologizing for bringing it before you at a time when there are so many more important questions to engage your attention; but it is a condition which is exceedingly annoying to patients, and the treatment which is generally employed for its relief, partakes so much of the crudity of ancient surgery, and so at variance with the experience of the writer, that I trust I may be pardoned for calling your attention to a more humane, conservative, and I doubt not quite as effectual a method of managing these cases as any now commended.

It is a condition which has been recognized since surgery had an existence and with but very little improvement, if any, in its treatment since the days of Celsus.

It is not my purpose to enter into any discussion of the causes or peculiarities of the affection, our reference books being so complete as to its etiology and characteristic descriptions as to leave nothing to be desired in that respect; but a variety of opinions exist as to the most desirable treatment, and this, therefore, becomes a question of importance to the specialist, and may, I trust, be discussed with advantage by the members of this society.

Of the management of the graver forms of this affection, as when complicated with entropium, or incurvation of the tarsal cartilages, there is perhaps a greater uniformity of opinion, but in the milder varieties, or where only a few cilia are involved, a variety of methods are employed for its relief, each of which has its supporters.

In the treatment of trichiasis two important considerations should be taken into account:

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1st. The patient must be relieved permanently of the annoyance; and

2nd. The treatment must be attended by as little suffering as possible, and without any injurious or undesirable cosmetic effects as sequelæ.

After a somewhat lengthy experience with the various accepted methods of treatment, the writer is forced to the conviction that many of the operations for the relief of this condition which are commended should be condemned, as they have no place in the practice of conservative surgery. Any operation which has for its object the removal of the hair follicles, either by the knife, electrolysis, or otherwise, must be considered unscientific, and open to objection.

The use of the electric needle now so generally employed for the relief of this condition, is not infrequently attended by severe pain, and a high degree of nervous erethism in timid patients; this renders it objectionable, particularly as it is exceedingly difficult to accurately insert the needle in such cases, thereby rendering it necessary to resort to general anæsthesia or a second or third operation before success is attained.

Experience has taught me that of all the methods which have been commended for the relief of this condition the one most applicable to the majority of cases, is a modification of that introduced by Celsus, which has now become obsolete, and is seldom mentioned in surgical works. This is due, probably, not so much to its inefficiency, as to the difficulties attending its practical application.

In the earlier years of my practice a modification of this method—first suggested by Snellen—was not infrequently used, and was known as the "stitching up process," the *modus operandi* of the procedure being as follows: A fine curved needle, armed with a double silken thread, was passed through the edge of the lid from within outwards, the open, or cut ends, of which were withdrawn from the wound and the needle removed, leaving a loop of the thread remaining, through which the offending cilia was threaded and the whole withdrawn, leaving the free end of the eyelash in the wound, in which position it continued to remain, and of course gave no further annoyance.

This little operation, which is so simple to describe, and apparently to put into practice, is nevertheless attended by more difficulties than is at first apparent, a fact which will be recognized by those who are familiar with the details. The results, however, when successfully carried out, are all that could be desired. Realizing this fact many

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surgeons have experimented with modifications of the method, with a view of simplifying it, but only to cast their devices aside as impracticable, or no improvement on that of the needle and thread.

Knapp conceived the idea of threading a curved needle with the eyelash while engaged in the wound, but abandoned it from the difficulties attending its application.

Wecker devised a needle with a hook in the end in place of the eye, which was also thrown aside as impracticable for various reasons.

The writer's early attempts to simplify this method were attended by the same or similar successes, but my latest or improved device promises to supersede my earlier efforts, and it is my pleasure to present it to you for your consideration.

Among the most serious objections to the use of the needle and thread was the size and depth of the wound necessarily made in passing the double thread, the difficulty of placing the cilia in the loop, and the retention of the same in the wound after the adjustment, particularly with shortened lashes.

In the instruments here presented an attempt has been made to have them constructed as small as practicable, to make their application as nearly painless as may be, as well as to prevent injury to the hair follicles and glandular structures bordering the lids, and to better retain the readjusted lashes in the normal position. The needle is slightly curved, and flattened upon its anterior, and ridged upon its posterior surface, and is made with cutting edges. This enables the operator to make a superficial puncture without its tearing out, as is frequently the case when the needle and thread are used, which is one of the objections to that method. The hook also has a slight curve to facilitate its use in overhanging eyebrows.

The use of these instruments is very simple: the needle being first inserted as close to the root of the cilia as possible, is carried from within outwards sufficiently deep only, to prevent breaking the skin, and should be from puncture to exit from two to three millimetres in extent, depending somewhat upon the location of the in-growing lash. The hook is then inserted from the outer side and the cilia engaged and withdrawn. The hook should not be regularly curved, but should be elongated somewhat, in which shape it engages the cilia better, and is less liable to be disengaged if the instrument is rotated slightly, as is necessary sometimes to facilitate its withdrawal.

The operation of readjusting displaced cilia by the aid of these

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instruments is but momentary, or probably less than one quarter of the time necessary for their removal by destroying the hair follicles.

In my experience the relief is not only prompt but has been permanent, and the objection which some have made that the life of the cilia is of but a few month's duration, and that a recurrence of the annoyance takes place with the new growth, I have found to be without foundation. The suffering of the patient is very slight as compared with that of the removal of the follicle by caustics or electrolytic action; and the method is efficient in all cases, except those accompanied by entropium, or where there is incurvation of the tarsal cartilage after trachomatous disease, which, of course, requires a more severe operation for its correction.

It is unnecessary for me to expatiate on the advantages of correcting the abnormal direction, or growth, of the eyelashes over that of the more severe methods of splitting the lids, extirpation, or transplanting of the hair follicles, by the aid of the knife, or destroying them by electro-cautery, electrolysis, etc. The deformities of the lids which are most certain to follow such measures, and of which there are numerous examples, are sufficient to condemn their use except in the most extreme cases.

DISCUSSION.

Dr. A. G. Warner: I wish to thank Dr. Beebe for his ideas upon the treatment of this troublesome disease. Certainly the methods of the past have been very unsatisfactory in my hands. Fortunately, I have very few such cases to treat now-a-days; and I am very apt to wish, when I see one, that I might never have another. With the new instruments which Dr. Beebe has devised and which I had the pleasure of seeing this morning, I should attack the next case with some degree of interest. Of course, the proof of the pudding is in the eating of it. Whether I shall succeed as well as Dr. Beebe has, I can only tell by trying.

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OPHTHALMIC AND OTIC USES OF SOME ANIMAL EXTRACTS.

By Isaac C. Soulé, Ph.D., M.D.,
Freeport, Ill.

THIS title is not strictly correct, in that the substances herein spoken of, are, perhaps, more properly designated, animal products or derivatives, as they are, with one exception, used exactly as found in the anatomical state, having only been dried, the better to preserve them, and *none* having received and *chemical treatment.*

Protonuclein.—This is said by its makers to be the *active* or *life* principle, the nuclein, of every gland in the body together with that of the brain. The extraction, is mechanical, after which it is dried. It is furnished in two strengths, the "Special," being full strength, intended for local use *only,* while for internal use a triturate in sugar of milk is provided.

The active principle is freely soluble in water heated to 98° F. but as there is also present some insoluble organic matter, the solution must be filtered or allowed to stand until this has settled, and then decanted. This solution will, if made with distilled water, keep satisfactorily in cold weather, but in summer it is more satisfactory to make a fresh one each day. They must *never be boiled,* as heat over 103° F. renders the active principles inert. To make the solution, add to 1 dram of distilled water, previously heated, 10 or 15 grs. of the special powder, shake well for a few moments and filter. Personally, the only use I make of the solution, is to occasionally give it to the patient for home use, the powder being more satisfactory for office use, and is the form used in these studies unless otherwise specified.

My study of this remedy was begun something over five years ago, I have endeavored to make it thorough, as exhaustive as possible, and accurate. Each and every clinical result herewith presented has been verified many times over, a written history of each case made at the time, and the cases kept under observation for from one to three years after discharged as cured. No selection of cases has been made for this report, but they were, on the contrary, taken at random from my case-books, only having been arranged in certain order, the better to illus-

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trate certain phases of action, which are, "A," those cases where a stimulant or nutrient is clearly indicated, and "B," those illustrative of its peculiar action on morbific growths or organizations.

"Class A."—CASE ONE.—Miss Z. V. H., age 18. First seen September 19, 1895. When four years of age the cornea of right eye was torn by being accidentally struck with the sharp point of an iron hand-sled runner, while at play with a younger sister. Three weeks after the accident happened the patient was placed under the care of Dr. J. H. Buffum, who succeeded in saving the eye, but gave no encouragement to their hopes of useful vision. *Present condition*—Right eye inflamed and painful, sensitive to pressure, worse from use of the other eye, if she catches cold or for any reason feels worse than usual. Apt to be inflamed and always painful at each menstrual period. No increase in tension. Patient very nervous, slightly hysterical, some choreic symptoms present. Great deal of headache, which always settles in nape of neck and between shoulders. Sore, tender spot, size of half-dollar, on the spine of fourth dorsal vertebra. General anæmia. Under atropia and very dark glasses, continued for two weeks, many of most distressing symptoms disappeared or grew very much better. Right eye still sensitive to touch but not inflamed, tension normal. On account of extreme irregularity of cornea, no view of fundus was possible. For the same reason failure was met with in the attempt to use Javal and the Placado disk. Under oblique light cornea is seen to be much more convex than the left, and to contain several irregular-shaped scars. Vision—Cannot count fingers nor find way about the room. Sees ten duplicates of candle-flame. With stenopaic disk at ax. 50° with —9 D. lens, only three images are seen. Vision—Counts fingers fairly well, at six feet. Left eye, slight amount of Has. Advised opaque glass for right eye and corrections for left. Patient refused to wear such correction, and would only consent to wear a broad, black velvet ribbon to exclude right eye during near work at home. Some improvement resulted from this, but it was very unsatisfactory. Patient was now seen by two well-known oculists of the old school, at my request, who both advised enucleation as the *best* treatment and *only safe* course. Consent to this was emphatically refused by both patient and parents. Referred patient for general treatment and began the use of Protonuclein locally. Cornea was liberally covered with the powder and then direct massage with a silver spatula practised for five minutes. Treated three times per week. Treatment continued regularly for three months, when the massage was discontinued, except at rare intervals, but the Protonuclein was used with more or less regularity until April 28, 1898, when a second attempt at correction under Scopolamine (2 drops, refraction at 60 minutes) was made. Right eye—Javal Ax 1.30°, = 44.5 D, Ax. 40° = 51 D. against rule. Images in these meridians are clear, regular and sharply defined, a variation of 2° either way, however, will render them so distorted as to be almost unrecognizable. Full correction as obtained by skiascopy was ordered. Vision un-

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corrected, fingers at 8 ft. with—1. D. sp. ⊃ 7. D. cy. ax 40° = $^{15}/_{60}$—3 letters, sees two faint images of candle-flame, one on either side of the bright flame. These were evidently only reflections due to prismatic effect of heavy concave cylinders, as they soon disappeared, unless she looked for them. Left eye—Javal ax 180° 43. D. ax 90° 43.8 D. Skiascopy + .63 D. cy ax 90°. Evidences of old choroiditis. V. = $^{15}/_{20}$. In right eye, no evidence of the scar-tissue can be discovered with + 24 D. lens and reflected light. Cornea clear and smooth. This patient has recently been examined with the result of obtaining V. O. D. = $^{20}/_{40}$ and Jæger No. 5 at 10 inches. Reads music and newspaper readily, only an occasional headache, eye never painful nor inflamed. Sore, tender point on spine and ache between shoulders entirely gone, is fleshy, pretty and consequently happy.

CASE TWO.—Miss J. S., age 40. Referred by Dr. B.

History.—Has been troubled all winter by something on right cornea; been under care of old-school oculist for past four months, with varying, but wholly unsatisfactory, results. Never better than at present time, June 15, '96. Inflammation and infiltration of cornea is so extensive that a careless examination might lead one to pronounce the trouble keratitis, instead of what it really is, an extensive superficial ulcer, measuring 2½ m. m. in diameter, with ragged edges and numerous small vessels extending to the limbus; extreme lachrymation and photophobia.

Treatment.—Curetted entire ulcer thoroughly, flushed it with solutions of formaline 1-10,000, gave patient solutions of 1-10 per cent. of scopolamine to be used every 2 hours and *Kali mur.* 30x every four hours. In five days ulcer had healed and cornea almost clear. This improvement only lasted a few days, when she returned with eye in almost as bad a condition as when first seen. I now learned from Dr. B. that patient is addicted to the use of morphine. Judging that there was a lack of nutrition to cornea, ulcer was again curetted and flushed as before, cornea entirely covered with Protonuclein powder, and light pressure bandage applied. Ulcer entirely healed in thirty-six hours, slight haziness of cornea alone remaining. Treatment was continued every day for eight days, then every other day for two weeks more. *Kali mur.* 30 x was given twice a day for the first ten days. At end of treatment cornea was clear and brilliant. Patient has had no return of trouble up to present time.

CASE THREE.—Delayed union following extraction of cataract. Mr. G., age 80. In good health and vigorous as a man of 70. Has been a drinking man for thirty-five years, but for past five or six years has not drank any at all. The wound made for preliminary iridectomy healed promptly and, apparently, solidly. Six weeks later I extracted the opaque lens. The wound being entirely in the cornea, capsulotomy was done with forceps, and entire operation from start to finish very satisfactory. Edges of wound coapted nicely. Eye closed with adhesive plaster, and protecting wire mask applied. No pain, inflammation, or untoward symptoms at any time present, yet at end of ten days

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wound remained open as freely as when made. Dusted wound very plentifully with Protonuclein powder, and closed as before. At end of thirty-six hours anterior chamber established for first time since operation. Dressing was reported twice, when patient was dismissed, with very faint gray line marking site of line of incision.

"**Class B.**"—CASE ONE.—Trachoma Pannus.

Daisy D., age 19. Referred by Dr. W., July 7, '97. Contracted trachoma in infancy and in spite of several active courses of treatment has steadily grown worse. *Present condition*—Right vision can see movements of hand but cannot count fingers, at 2 feet. Left vision, fingers at 6 feet. Lids considerably contracted. Palpebral fissure so short that lids cannot be everted. Considerable ectropium in both eyes. Cornea uniformly densely infiltrated throughout entire surface. No light reflex possible. July 17th, under A. C. E. anæsthesia, did a free canthoplasty on each eye, together with thorough expression of trachomatous bodies, with Knapps' roller forceps. Only the upper lids were treated, as patient did not take the A. C. E. well. Dressing following operation; the lids were cleansed of all traces of blood, by sponging (cotton) with hot formaline $^1/_{1000}$ solution, dusted with Protonuclein powder, and the powder well rubbed in, again plentifully dusted, together with the wounds at the angle, lids closed with adhesive plaster, dusted over again, covered with light pledgets of absorbent cotton (which had been previously thoroughly impregnated with Protonuclein powder), all held in place by wire masks and tapes. Dressing remained in place for forty-eight hours. Wounds healed by first intention. No swelling of the lids. From this time until September 1st eyes were treated every day, first cleansing well with formaline, $^1/_{1000}$ solution, then applying Hodge's argentum iodinum mixture (see Note I.) considerable force being used in rubbing same into lids. Eyes were closed and massaged for five minutes through lids.

At the end of ten days, the corneal condition not improving, Protonuclein was substituted for the Hodge ℞ every other day, using it liberally and massaging through closed lids for five or ten minutes. Cornea began to clear almost immediately, continuing to improve until, when dismissed, only by using a + 26 D. lens could any fine dots be discovered. The upper lids were smooth, covered with healthy conjunctiva, and free from scar-tissue. In the lower lids the trachomatous bodies, following the use of Protonuclein powder, were noticed to become more prominent, that is they seemed to become more like small round grains resting on the healthy conjunctiva, at the same time gradually growing smaller as treatment continued, until they entirely disappeared. Corrected vision of this case when dismissed, was, right

NOTE I.—Hodge ℞ consists of two solutions. No. 1, Arg. Nit. 3i, Glycerine 3ii, Aqua, 3ii, mix. No. 2, Potass. iodidi, 3ii, Glycerine, 3iv, Aqua. 3ii, mix. Sig. To 5 gtts. of No. 1 on a clean watch-glass, add 10 gtts. of No. 2. Apply resulting yellow precipitate to lid with cotton-covered applicator. *Ophthalmic Record*, Vol. I., page 85.

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eye $^{20}/_{04}$, left eye $^{20}/_{35}$. Jæger No. 4 at 10 inches. Duration of treatment nine weeks.

CASE TWO.—*Leucoma.*—Mr. Paul W., age 27. Referred by Dr. W., July 27, '98. Some time ago while a medical man was attempting to cauterize a small nodule on the upper right lid, a granule of the mitigated stick became loose and dropped into the eye. A dense white leucoma, triangular in shape, covering the lower temporal quadrant of the cornea, apex nearly in the center, was the result. Treatment—The scar was covered well with Protonuclein powder and massage applied direct to it, with a silver spatula, again covered with the powder, the eye closed and an exclusion bandage applied, to be retained two or three hours. Patient was directed to apply an ointment of 1 gr. of Mercury to the oz. of Vaseline, to the eye at night and massage for ten minutes through the closed lid. In the morning to bathe the eye for ten minutes in *very* hot water, and immediately follow with a bath of iced water for an equal length of time. At end of six weeks patient discharged with only a small spot, of light gray, near the cornea-scleral junction in lower temporal quadrant. Remainder of cornea clear. Vision $^{20}/_{60}$. Old choroidal changes precluding any better.

CASE THREE—*Suppurative Otitis.*—Mrs. A., age 38. Referred by Dr. A., whose wife she was and under whose care she had been up to time she came to me. History—Something over two months ago she was attacked with La Grippe, then prevalent, during which, the middle ear became implicated. Both ears were attacked but only the right ear suppurated, the discharge which was very acrid, excoriating and plentiful, had existed for nine weeks. There was a small perforation of Shrapnell's membrane while almost the entire lower half of the membrana tympani was destroyed. Within the tympanic cavity and on the edges of the perforations were numerous granulations. The ear was thoroughly cleansed by spraying it with Hydrozone, 3 per cent., and wiping out with absorbent cotton. Some Hydrozone was next dropped into the external canal, and, by means of a tip fitted to the compressed air cut-off, forced through the Eustachian tube into the post-nares. Protonuclein powder was now blown into the middle ear, using compressed air and sufficient force to get the powder distributed to all parts of the cavity. Patient was directed to cleanse the ear, by dropping in Hydrozone, with a dropper until all bubbling ceased. Making the application every two hours. Patient was treated every day, and although five days were lost on account of a crop of small boils, on February 3, two weeks after the first visit, only a slight bland discharge remained, which entirely disappeared during the next three days. Treatments were continued three times a week until February 27th, when patient was dismissed, hearing distance increased to 36-120 from 3-120 and perforations in membrane both completely repaired. Duration of treatment, six weeks.

Supplied Blood.—Studies were first made with fresh bullock's blood, but had to be abandoned on account of inability to preserve the blood. Later defibrinated bullock's blood, known as Bovinine, was used, with

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perfect satisfaction. I will cite two of the many clinical cases in which it has been successfully used.

CASE ONE.—*Lupus* of upper left eyelid. Miss C., age 20. This case came from a general surgeon of undoubted ability, who had two microscopical examinations made confirmatory of the diagnosis. It had received the usual treatment for three months and although at one time almost healed has broken down again, and is now 1 c. m. long and 15 m. m. broad. Very angry. General health not good, much emaciated. Treatment—Ulcer was curetted and cleansed by spraying first with Bovinine and then with Hydrozone, 3 per cent., washed off with Listerine solution, sprayed with a 5 per cent. Hydrozone, and washed again with Listerine. Edges of ulcer cauterized with electric cautery, and gauze dressing applied, which was kept moist with Listerine for thirty-six hours. Ulcer was now clean and not nearly so angry looking. It was again cleansed with Hydrozone 3 and 5 per cent., and same dressing applied for forty-eight hours longer. At end of this time ulcer looking much better, and patient complaining very much of the severe pain in ulcer, it was determined to commence the use of supplied blood. After cleansing ulcer, it was sprayed with the blood, covered with eight layers of gauze, thoroughly saturated with the remedy, a sheet of rubber placed over the gauze, the rubber covered by two layers of dry gauze and the whole painted with collodion, except at the upper edge, which was left unfastened. Bovinine was applied by means of a dropper at this unfastened edge, every two hours, thus keeping the dressing saturated constantly. The remedy was also given internally, in tablespoonful doses, every three hours at first, soon increased to a wineglassful every four hours, with a wineglass of old Port wine, night and morning. The dressing was not disturbed for one week. The pain disappeared at the end of twenty-four hours, never to return. Wound steadily improved, until at end of four months patient was dismissed cured, the site of the former ulcer being covered by a soft, smooth, pink scar. Patient had gained nine pounds while under treatment. Two years later patient is plump, healthy, and happy, cure apparently perfect.

CASE TWO.—Mrs. A., age 38. *Traumatic Necrosis of Left Mastoid.* Necrotic bone was thoroughly scraped and chiselled away, cavity mopped out with Hydrozone, 25 per cent., packed with gauze, which had been soaked in Iodoform-Bovinine; dressing was kept saturated by dropping on fresh Bovinine every hour. Dressing was changed every twelve hours for first three days, the cavity being cleansed with Hydrozone, 5 per cent., each time. On the fourth day plain Bovinine was substituted for the Iodoform-Bovinine, and the dressing changed only once in twenty-four hours. At end of six weeks the cavity was completely filled with new bone, and the edges of the flesh-wound having been freshened and brought together, healed nicely, leaving scarcely any scar, instead of the usual unsightly condition.

Suprarenal Capsule.—The preparation used was that of Armour & Co., and is the dried gland of the sheep, powdered. Much difficulty was

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experienced in preparing a satisfactory solution, owing to its ease of putrefaction. This has been to a degree overcome by the following method. Ten grains of the powder are added to 1½ dram of freshly boiled distilled water contained in a large test-tube. The mixture is well shaken, corked with cotton and allowed to stand for an hour or two, occasionally shaking it. It is now boiled for ten minutes, and filtered into a clean glass-stoppered bottle. Solutions prepared in this way will, in moderate weather, keep for ten days to two weeks. The boiling does not seem to interfere in any way with the peculiar action of the drug. For use in warm weather a solution of formaline $^{1}/_{1000}$ may be substituted for the distilled water with some advantage. However, solutions prepared with formaline, while they seem to act in all other ways the same as other solutions, lose, I think, somewhat in their power as hæmostatics. Solutions so long as they remain clear and retain their peculiar "fresh" odor have not deteriorated. Even when the odor becomes quite pronounced they still remain efficacious. Studies intended to demonstrate the remedial action of this gland have uniformly been failures, if we except slight inflammations and injections of the membrana tympani and conjunctiva. It is however a highly useful drug to the oculist and aurist, owing to three peculiar properties which it possesses—*i. e.*, (*a*) that of blanching mucous membranes, whether they be actively inflamed or only slightly injected; (*b*) of controlling, even to the point of often preventing entirely, hæmorrhages; and (*c*) aiding, strengthening, or increasing the absorption or penetration of certain drugs. It has proven itself useful in cases of abraded cornea, foreign substances in the eye, trachoma, and all conditions which give rise to intense injection, and where it is desirable to for any reason produce cocaine anæsthesia, which, under those circumstances, is so difficult of proper accomplishment. If the inflammation be very great it is desirable to invert the lids and allow a few drops to flow gently down over the inverted surface into the eye, wait a few moments and apply the cocaine (4 per cent. to 10 per cent.) in the same way, and in a short time make a second application of the Suprarenal solution. If very profound anæsthesia is required, it is necessary to make two or more applications of the cocaine or use the stronger (10 per cent. to 15 per cent.) solutions. Under anæsthesia produced in this way I have performed iridectomies, extractions, advancements, curettements, cauterizations, Knapp's operation with the roller forceps, excision of membrana tympani, and several minor operations within the middle ear, all entirely painless and surprisingly free from hæmorrhage.

Thyroid Gland or Thyrodine.—The source, and method of preparing the solutions are the same as already given for suprarenal. An unexpected and protracted sickness renders this report, unfortunately, very unsatisfactory, and it is incorporated at all only in the hope that it may induce some of the Fellows of this Association to take up, and complete the study of what I think will prove a useful adjunct to our art. Unlike suprarenal, this gland seems to have a decided remedial

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action. It was used successfully in tumors of the conjunctiva and lids, pterygium, exophthalmos, and follicular conjunctivitis.

Summary.—PROTONUCLEIN, has a decided action upon the nutrition of the cornea greatly aiding it. It also appears, to in some way, affect the growth and continuity of tumors, etc., as is instanced in its action in trachoma. It produces decided and marked ear symptoms, when given in large doses. These symptoms closely resemble those of *China sulph.* with which remedy they are here compared.

PROTONUCLEIN.—Deafness in both ears, unaccompanied by any particular headache or symptoms. Tinnitus, ringing of bells, buzzing, ill-defined ringing in *both* ears, cannot hear sounds because of it. Persistent ringing of *small* bells. Nervous, weak, and unsteady heart, rapid increased action. Pulse, full, strong, bounding.

CHINA SULPH.—Deafness in both ears; full, confused feeling. Headache accompanies. Ringing almost always in left ear, very rarely in right. Nervous, weak, and unsteady heart, rapid, increased action. Pulse, small, weak, easily compressed.

Used according to these few symptoms in anæmic patients, suffering with tinnitus, results have been uniformly good. The active principle of Protonuclein is destroyed by all solutions containing alcohol, mercury, chlorine or bromine, their salts, acids or alkaloids. It is *not* affected by iron, strychnine, quinine, arsenic, iodine, phosphorus, or their salts. While it must not be used in combination with or closely following the use of its incompatibles, it will very materially enhance their action if used two or four hours before them.

Supplied Blood.—This was found to be frequently successful, in ulcers where Protonuclein had failed. It has a very decided *antiseptic* and *deodorizing* action. Is an excellent anodyne, patients invariably experiencing a relief from pain in a short time after its use. It aids *vitality greatly.* It has been successfully used in the dressing of operative wounds, ulcers, burns and scalds; in the treatment of necrosis and skin-grafting. As it is necessary that the part under treatment be kept constantly bathed in it, it is only applicable where a dressing can be used, thus almost precluding its use *within* the eye or middle ear.

DISCUSSION.

Dr. Piatti: I think it must be admitted by all the members of this Society that Dr. Soulé has contributed a very timely and interesting paper, even though we may not agree with him fully as to some of the conclusions contained therein. It is with temerity that I discuss this paper, since my use of the remedies in question has been limited to the treatment of diseases of an entirely different character, hence my discussion is more from a theoretical than a practical standpoint.

I have used protonuclein considerably in my practice and have followed the literature pertaining thereto very carefully for some time past, but I have never seen it recommended locally, in the eye, as sug-

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gested in the Doctor's paper. The Doctor has certainly met with phenomenal success in some of his cases, and it is only to be regretted that he did not report failures in the use of the protonuclein (that is, if he had any) for it would have been a more certain way of demonstrating the true estimate of its value in ophthalmic practice.

Case 1.—as reported would lead us to suppose that the protonuclein certainly had the power to bring about the absorption of cicatricial tissue and infiltrations of various kinds in the cornea.

The Doctor states in the first examination, he was unable to see the fundus owing to the irregularity of the cornea. At the last examination of the eye, the Doctor succeeded in getting such a good test, I would like to ask him if he obtained a view of the fundus at this or any future examination.

We must not lose sight of the fact, that the Doctor massaged the eye for five minutes on each application of the protonuclein and this, in itself, if persistently carried out, will often cause the absorption of corneal opacities.

Cases 2 and 3, I pass without further comment, as they depend upon the same power of the drug as the preceding case.

Class B. Case 1.—This case does not to my mind demonstrate positively that the protonuclein has any effect on trachoma.

The methods used by the Doctor (Knapp's roller forceps operation and the use of Hodges' Argentum-Iodium Mixture,) would have given him the same result without any use of the protonuclein whatever.

I recall several cases of trachoma where the upper lid only was treated and in which absorption of the trachomatous bodies took place in the lower lid, without any further treatment, so that the disappearance of the diseased tissue in the lower lid, after the operation does not to my mind, demonstrate that the protonuclein was the cause of the absorption; although I must admit that the pannus disappeared very quickly. It is to be regretted that the Doctor did not treat some of his cases of trachoma with the protonuclein alone, instead of using in conjunction therewith other methods, either one of which will cure this disease. Of course I do not mean to detract from the value of the protonuclein, for I firmly believe that it has a specific action on the cornea as the cases reported by Doctor Soulé show. What I object to, is the treatment of cases, by "Mixed Methods" where one wishes to demonstrate the action of a remedy, comparatively new.

The only use I have made of the protonuclein in ophthalmic practice has been in a case of epithelioma of the face involving the lower lid.

Mr. H————————, aged 38, mechanic, has had growth on side of nose and cheek for about five years, which has increased gradually and steadily, until at present time, it is about an inch in diameter and involving about $^1/_3$ of the lower lid. Has been under treatment during most of this time, but notwithstanding, the disease has steadily progressed. After a careful examination, the growth was removed, except that portion involving the lid, which was curetted. A flap taken from

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the cheek, a dressing of protonuclein powder special applied and removed in two days. Wound healed by primary intention, lower lid very much swollen and upper lid also much infiltrated, was thoroughly cleansed with hydrogen-dioxide, followed by hot salt solution, this treatment repeated daily for one week, at which time the swelling was reduced and wound re-dressed with protonuclein which again caused great swelling of the lid, which however disappeared after three days, and thereafter the protonuclein was applied every third day for three months.

Protonuclein was also given internally, no other drugs being used. At the end of five months, patient discharged as cured, nothing remaining of the growth, but a small scar and a slight eversion of the punctum lachrymali which was afterwards slit.

I would like to ask the Doctor, in applying the powder to the cornea, if he found it necessary to produce anæsthesia? My use of the remedy in suppurative otitis has been limited to two cases, but the result was in no way, more brilliant than those cases in which I cleansed with H_2O_2 and give the remedy indicated generally *Viola odorata* 30, which is my sheet anchor in these cases.

Supplied Blood.—This remedy I have used in the form of bovinine, I have used it in ulcers of the cornea; result—nil.

I treated one case of necrosis of the tibia successfully after all other remedies failed, keeping it constantly moistened, as suggested in the paper. Dr. Soulé states that it is only applicable where a dressing can be applied and I fully agree with him; such being the case, I fail to see its relation to ophthalmic or otic practice.

Supra renal capsule ought to prove a very valuable remedy on the lines laid down by the author and I trust that at the next meeting of this Association, we will receive reports on its use, especially from those members who are connected with large clinics and who thus have an opportunity of having a large number of cases under observation. With this remedy I have had no experience.

Referring again to protonuclein, I might state, that I have given it, in a number of cases of typhoid, internally, but have never noted any symptoms attributable to the drug, even when given in large doses.

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ON THE DESIRABILITY OF EXAMINING THE INMATES OF OUR BLIND AND DEAF ASYLUMS.

By C. H. Vilas, M.D.,
Chicago.

A BRIGHT, healthy boy, about twelve years of age, was brought to me for examination, having been taken from a blind asylum for that purpose.

For a number of years during the lectures which I have given in connection with the annual course at the Hahnemann Medical College and Hospital, of Chicago, it has been my custom to call the attention of those about to graduate to the desirability of examining into the condition of the blind and deaf in the various asylums throughout the country, and this lad came as a result.

He proved to have a posterior polar cataract in each eye. We all know how intractable such cataracts are under a needle operation, and hence after exploration of the lenses, I iridectomized each eye in the inferior nasal quadrant, the iridectomies proving exactly symmetrical, as desired. The boy quickly learned to read, and repeated visits to me have confirmed the excellent results attained.

This case demonstrates that it is possible, despite the care now so generally exercised by our institutions, for an unfortunate to be found within them who could be not alone raised to a higher plane, but restored to active life. It is possible therefore that a re-examination of those already admitted to our asylums might disclose others who could be similarly benefited by like operations or a careful course of treatment, means perhaps unknown at the time or in the district from which the inmate came. Were but a single case so found materially benefited, sufficient would be gained to make the reward ample. How many more might be successfully treated could only be told by trial, though it is not unlikely a number of such might be discovered, judging from the reports of the numbers there immured.

Asylums for the deaf should also receive our attention for similar reasons; and especially those cases therein where ear troubles are associated with mental derangement. Fortunately the excellent care such persons now receive usually provides for their treatment in this respect. But re-examination of these and of those declared blind can do no harm and may yield excellent results.

Practitioners who are located in the neighborhood of asylums will,

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I am sure, be cordially aided in investigation by those in charge, and results may be attained quite as valuable as were secured in the crusade waged for the examination of the eyes of school children for refractive troubles. Moreover, such labors will lead to the examination of State laws and such corrections suggested as may be necessary to provide against errors in admission, and correction of any already made.

DISCUSSION.

Dr. Shepard: We are all in sympathy with Dr. Vilas' paper, and I have very few words to say, except that I would advise that all our institutions, not only those for the blind but those for poor children generally should have an examination of the eyes; that is, of the vision, by a specialist. A number of these children have come into my hands which have been looked upon by their teachers as dull and of very poor mental capacity, where a careful examination of the vision has revealed a very high degree of refractive error. A few weeks ago, one was brought to me with nine diopters of hyperopia. The fingers were counted at five feet without a glass, and with the correct glass, vision of $^{20}/_{30}$ was obtained. That boy of ten or eleven years of age, although showing some bright ideas, was looked upon as being peculiar, and was of little use to himself or any one else; but when I put the glass on, he said, "Now I will learn to read." It seems to me that the consulting oculists of our institutions should be made to look more carefully after some of the hidden troubles in the eyes—not simply be called in when there is some acute inflammation.

Again, as to the deaf. Our work among the deaf children and deaf people should begin, really, before the deafness occurs; and it may very often be averted by carefully looking after the throat and nose. I am sure that a very large percentage of the bad cases of deafness and suppuration could be averted, if every child, upon entering our charitable institutions, could be brought under the practiced eye of the aurist, and attention given to the diseased condition of the vault of the pharynx and Eustachian tubes.

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RESULTS OF CASES TREATED BY PHONO-PNEUMO MASSAGE.

By Benj. S. Stephenson, M.D.,
Lowell, Mass.

A YEAR ago I had the pleasure of reading a paper on this subject at the Chicago meeting of our society, and showed you a very crude machine for producing it. After returning home I received a number of inquiries as to what it would cost to get out a practical instrument. For the next six months I caught it from all sides as relying on the statements of my electricians, I made promises as to the time of delivery and the perfection of mechanism, etc.

I was at last compelled in order to redeem my promises given in good faith on my part to manufacture them under my own supervision, and to-day I am able to show you a practical instrument which has been able to accomplish results in my own and the practice of others. As our President said to me last year give us statistics that are tangible, and if you can do one-third that you claim we want it to. You know it is an old saying that an inventor can obtain results when no one else can, so if you will allow me I will quote you extracts from letters received from Drs. Findley of Des Moines and Bates of Hamilton.

"Dr. Findley says: First. It paid for itself the first month. Second, my patients are all enthusiastic over it. Third and most important of all I have been able to improve the hearing in cases that I have failed in before."

"Dr. Bates, says, in regard to a case that he had had in his care for the past five years and who had a severe relapse following a cold that in one months treatment he had obtained better hearing than he had in any of the past five years and for a long time previous to that."

Now I shall not take up but a little of your time and will present a list of five cases covering in age, condition, and various phases of deafness, those which ordinarily present themselves in our practice.

Case One:—Miss C., age 23, light complexion, robust in appearance, general health good. Complains of ringing noises in the head, worse on left side at night after retiring. Hearing on the right side for watch six inches, over the mastoid distinctly, C2 fork heard at fifteen inches for five seconds, low tone of voice speaking slowly at six feet. Left side, watch at seven inches, distinct over mastoid, C2 fork at 16 inches for 8 seconds, low tone of voice at six feet.

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On inspection, canals clear, slight thickening of drum, poor response to suction with otoscope, on each side. Eustachian tube easily dilated with air at 10 lbs. pressure. Mucous membrane of pharynx congested and thickened, nares clear. First noticed noises about eighteen months before, but paid no attention to them until she found her hearing was being affected. The treatment pursued in this case was fifteen minutes of sound massage beats at 180 per minute, followed by sound and pneumatic massage for ten minutes using suction two to pressure one and ending by using direct suction for five minutes. This was followed for five weeks, three times a week at first and then twice a week for the last two, with the following results. At the end of first week, a gain at the end of treatment of two inches for watch but this only lasting for two or three hours, no difference in tinnitus. End of second week watch heard at twelve inches lasted longer and tinnitus not as constant or loud, also said that people were talking louder than necessary. In this case there was steady gain and at the end of five weeks the hearing was normal and tinnitus had ceased I looked the case up last week and she said that her hearing was all right and there had been no return of tinnitus, this case was treated last August.

Case Two:—An English woman, Mrs. S., been in this country five years, age 43, says she has been deaf for 20 years, and has had plenty of experience with quackery both in this country and England. Has had continuous tinnitus for the last three years. Hearing on the right for watch pressed close against the auricle, not heard over mastoid, for the C2 fork at three inches when struck a metallic blow, the voice in a full loud tone at three feet. The left side slightly worse. On inspection the canal dry and scaly, drum white and pearly, retracted and the malleus very prominent, no movement with otoscope, throat dry and glazed in appearance, inflation of Eustachian easy with pressure at ten pounds at which I use it for inflation. This case had been told by Blake of Boston that nothing could be done except an ossiculectomy and could not promise success with that.

In this case sound massage at 180 beats per minute was used for 15 min. and then sound and pneumatic for 10. No suction was used on this case for the first two weeks on account of the parchment like condition of the membranes. She came 3 times a week for two months and although the improvement was slow there was an increase and she could then hear the watch at three inches, could hear the dishes rattle when using. She continued coming for two months more and gained so that she could hear ordinary conversation at five feet, the drum had a healthier color and was movable with the otoscope, the tinnitus stopped after the 10th week, but would return at times when very tired or nervous.

Case Three:—Miss R., age 34, complained of a chronic discharge of the left ear which had followed an attack of scarlet fever when she was 20. Her hearing for the watch was at 3, and C2 fork at 6 inches, but was lost after 3 seconds. On the right side the hearing was 7 inches for watch and the same for fork continued for 10 seconds. On inspection

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the left showed canal filled with a thick foul smelling discharge, after removing which I found shreds of drum, absence of malleus and portion of incus, the attic filled with discharge and necrosed tissue, the right, drum retracted, and but slightly movable with otoscope, decided thickening and the malleus handle prominent. In this case all the necrosed tissue was removed and the parts cleansed with a solution of alcohol, borax and water used as warm as possible, then used suction on the left side each time first and cleansed with dry cotton, then used the sound massage and pneumatic massage for fifteen minutes each followed by ten minutes on the suction for both ears.

The discharge ceased in three weeks, and the hearing came up to normal on the right and to twelve inches for watch on the left.

Case Four:—Mr. K., age 56, hearing has been poor for years, very annoying tinnitus for which he had the drum and malleus removed on the right side without relieving the condition. Hearing for the watch not at all on the right, C2 fork heard at 2 inches when first struck, also by mastoid. Left ear, watch not heard at all, fork at six inches when first struck, voice heard by making a trumpet of hand. The drum on inspection retracted, malleus prominent, membrane parchment like and no reaction to otoscope. Difficult to inflate Eustachian even with chloroform. This case was the most difficult one I have come in contact with and been able to obtain what he considered good results. He was under treatment for six months, using sound massage 180 beats at first and later 240 per minute and the sound and pneumatic for fifteen minutes each, as the drum became more pliable on the left side using the suction for five and then ten minutes. At first improvement was not noticeable but the tinnitus began to lessen at the end of the first month and at the end of three months was not noticeable, the hearing improved so that he could talk with one person if there was not much collateral noise as he found it hard to separate sounds.

Case Five:—A little girl, age six, chronic discharge of two years standing, following measles, thin acrid foul smelling and making the meatus raw where it touched. This case was under the care of my wife as it came while I was on the west coast.

Membrana tympani gone in lower third, on each side. Hearing for the watch 6 inches, clearly over mastoid, C2 fork heard by air conduction at 10 inches, also over mastoid, voice at 4 feet speaking slowly and distinctly. Treatment consisted of dry cleansing and use of suction followed by sound and pneumatic massage. The discharge ceased within three weeks, and the drum gradually filled in, and within seven weeks her hearing was normal. Of course this last is what would be considered an easy case and yet these cases are the ones that lead to permanent impairment of hearing.

Now as a summary of results, I find that my experience continues this year the same as it has for the last four. There are but very few that cannot be helped. About 40 per cent. of cases can be given good

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serviceable hearing, and the others improved to a greater or less degree dependent on condition, age, duration of disease and health of patient.

From what I can learn from inquiry from those who are using massage in this form better results are being obtained than have been possible before, and I think the reason for this is that while the nutrition and mobility are increased, the thickening lessened, at the same time a nerve whose perceptions are slow and feeble is being trained. That this enters into the case can be easily proved as almost without exception a person who is deaf will hear without raising the voice if you speak slowly separate your syllables and give the nerve filaments time to convey one sound impression before the next is uttered.

I was talking with one of the prominent aurists of this country a short time ago in regard to the treatment and he said "Doctor I have no faith in it at all, I experimented with massage twenty years ago and proved it a failure." I then asked him if at that time he ever used more than one form of massage at the same time, and he acknowledged he had not. I then told him about experimenting a year or two ago and finding that each form of massage would do a certain work and then a limit was reached beyond which it was impossible to go, but take the same patient who had been using phono massage alone and it took but a comparatively short time by using pneumo massage to bring about a good result, and the same with pneumo massage. Both have got to be used singly and in combination at the same treatment to get a good result.

I wish to call your attention particularly to the action of the pneumatic apparatus on a U tube partly filled with water. I think the benefit of massage comes largely from the slowness of the beat—allowing the muscles to act themselves on the return stroke, not doing the whole with the instrument. Time should be given after the direct suction to allow the action to exercise the muscles and ossicles connected with them.

DISCUSSION.

Dr. Bates: I don't know that I can do more in discussing the paper of Dr. Stephenson than give my own experience in the use of his phono-pneumo-massage apparatus.

Some years ago, when I first read Dr. Garey's article on the massage treatment for catarrhal deafness, it struck me as being the most feasible method of producing mobility of the bones of the ear, that had yet been introduced. I immediately purchased a phonograph and the cylinders devised by Dr. Garey, together with some musical cylinders, and commenced experimenting with the same. I could see nothing particular

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to guide me as to the number of vibrations which would be applicable to certain cases, so tried various instruments on the phonograph, of high and low tones—in cases where there was tinnitus, trying to get as near the sounds heard by the patient as possible. In some cases I was able to stop the tinnitus (even in cases of long standing) almost immediately, in others, (even in cases of short standing) I was not; but wherefore, I know not as yet. One thing is certain, I have had better results in treating catarrhal deafness since I have been using the massage treatment than ever before; so much so, that I know no one in Canada to-day has a better reputation for treating the same than I have. A short time ago a patient was sent to me by an allopathic physician whom I did not know, in one of the larger cities in Ontario, who, he said, told him I was the best man in Canada on the treatment of deafness. I mention this simply to show the superiority of the massage treatment over the old method; for I know by my own experience, that no method of treatment for catarrhal deafness has ever been introduced as yet, by which any specialist can compete successfully with one who uses the massage treatment. I have used various instruments: viz., the phonograph, vibrometer, vibrophone, telephonic connection with the Faradic current of electricity, and also the galvanic current in connection with the phonograph; but of all the instruments I have used up to within the past few months, I have had better results from the old "saw mill" of Dr. Garey's, followed by a cornet or piccolo solo on the phonograph, than from anything else. Since then I think I have had better results from Dr. Stephenson's instrument than from any.

But to mention a case in point. Something over six years ago Mr. J. E. A., aged 42, came to me for treatment. He had been more or less deaf for thirteen years, and had been under treatment most of the time during that period. It was the hypertrophic form of catarrhal deafness. He had been under the care of four specialists of the best reputation in Canada, two in Montreal, one in Toronto, and one in Hamilton, and also one in London, England, and one in the United States. He told me that none of them had ever improved his hearing, though he had no doubt that he would have been much worse without the treatment he had received. When he came to me, his hearing for the watch was pressure on the left side, and about ten inches on the right. If any one spoke to him on the left side, he had to turn his right ear to them in order to hear what they were saying, and when he went to church he had to get near the front and turn his right ear to the preacher. Tinnitus had been a constant symptom in his case from the beginning, changeable in its character, sometimes being of a rushing sound, at others a high-pitched singing noise. I treated him for four months every day; at the end of which time he could hear the watch tick four feet away from both ears, in the room I use for treating ear cases, where the normal distance for hearing the watch I use for that purpose is ten feet. I tried to increase it beyond that, but could not do so. However, his hearing was practically good, so that no one in speaking to him would suspect that it was at all impaired. He heard equally well with

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both ears, and when he went to church could sit in the back seats and hear well enough. The tinnitus was entirely stopped, only having returned a few times since when he has had a cold. During the past six years he has come to my office about once a month for treatment, and, when he caught cold, would come three or four days in succession, with the result that for the six years I have been able to keep his hearing up to the four feet for the watch in both ears. About three months ago he caught a very severe cold, which affected his ears to such an extent that he could hear the watch only about two inches from each ear. I then commenced the treatment with Dr. Stephenson's instrument, which I was using at the time. I treated him every day for a few days, and then three times a week for six weeks; at the end of which time he could hear the watch tick seven feet away from the right ear, and six feet from the left, and the last time he was in, he told me that the night before he had heard the fire bells ring down town—about a mile away from his house—and sat up in bed and listened to them. He said he heard each stroke distinctly, and had never been able to hear them before. This is the only case I have had, which has led me to believe that this instrument is superior to any others I have used, though I have had just as good results from it in many other cases as from the use of the phonograph. I have not, however, given up using the phonograph; as after using the phono-pneumo-massage instrument, I usually end up with a musical cylinder on the phonograph, believing it has a good effect. The massage treatment for deafness, is in its infancy as yet. I have believed from the beginning that there were great possibilities in it; and as time goes on I am more convinced than ever, that it is the proper method of producing mobility of the bones of the ear. I trust that the members of this society who have not used the massage method, will do so; and those who have used it for a short time and cast it aside (as we are all too apt to do with any new thing when we do not see quick results) will take it up again.

The data upon which to apply the massage treatment; i. e., the sounds or numbers of vibrations to use in each particular case, is very difficult to get at; but if we all work together with that one end in view, and when an idea strikes us, let it be known through our JOURNAL we will no doubt one of us, some of these days, strike a happy thought that will lead to a solution of the difficulty.

There are many things about deafness we all have to learn as yet; but when our knowledge is more complete regarding the causes of various symptoms connected with certain cases and not with other, such as tinnitus, aural vertigo, paracusis Willisii, and others in which certain sounds are heard much better than other sounds, we will know better how to apply massage treatment. I have one young lady under my care at the present time, who is so deaf that she can only tell what a person is saying by watching their lips, and still she can hear my watch tick two feet away from either ear. This is an extreme case, but we all meet the same occasionally to a lesser degree, as well as the opposite,

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where they can hear ordinary conversation readily but cannot hear the watch tick at all. An accurate knowledge of the pathological condition in these cases, together with their cause will aid us in the application of the massage treatment.

Dr. Houghton: I trust that you will all give your attention to one point. I think if we can determine that, it will be a very great advantage, certainly to the patient, and it is this—to make a careful attempt at a diagnosis of the conditions existing in every case when the treatment is undertaken and when there is apparent failure. If the researches of our European colleagues are correct, it would seem that it would be practically useless to apply for any length of time aural massage in a case of ankylosis of the stapes at the fenestra ovalis. We meet there a barrier which is apparently next to impossible to break through. All the other relations are somewhat modified by massage; and I have come to question, in my own observation of cases, whether such an osseous union may not exist in these cases that do not exist in those cases that yield within the limits of ordinary treatment. It is very difficult to settle all these points to-day. Those of you who are familiar with the subject, of course know Dr. Roosa's views as to the shading of this differential diagnosis. If we could follow out our German colleagues' practice of comparing the clinical case with the post-mortem result, we could thus learn something more about it. That is one thing which I hope our observers will try.

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MASSAGE OF THE MIDDLE EAR BY ALTERNATING INTERNAL AND EXTERNAL PRESSURE.

By Francis B. Kellogg, M.D.,
Los Angeles, Cal.

THE development of massage as applied to the middle ear, has been an interesting study. Pneumo-massage, with the Siegel speculum and Delstanche masseur represent the early steps in this direction. Then came "vibro-massage," suggested and applied by members of our own school: Following this, the idea of pneumo-massage was still further developed by Chevalier Jackson, who secured uniformity and rapidity of the suction-pressure action by means of an electric motor attached to what was practically a Delstanche masseur. Still later the two ideas were combined in an apparatus for phono-pneumo massage, described before the last session of this society by Dr. Benj. S. Stephenson, of Lowell, Mass.

With the recent invention and perfection of the multiple comminutor, or nebulizer has come the suggestion of massage of the middle ear through the Eustachian catheter. By connecting the escape tube of the comminutor with the catheter *in situ* the medicated vapor is forced into the tympanum under pressure. Massage is secured by means of a needle valve, which simply interrupts the current of vapor at the will of the manipulator. Thus the middle ear and membrani tympani are subjected to a series of impulses, all coming from the same direction, *viz.*, from within out.

It occurred to me that this was an inadequate and incomplete form of massage, and that to be effective in securing mobility of the parts there should be an alternating of corresponding degree from without inward in the external canal.

This was secured in the following manner: The Eureka nebulizer, which was used, has two escape tubes, one for nebulizing medicated oils and the other, with a cut-off, for use with the spray tubes. After introducing the catheter, it was connected with the nebulizing tube by means of a sliding hard-rubber connection, while the cut-off tube was connected with the external canal by means of a tight ear-piece and a piece of rubber tubing. After introducing and connecting up the catheter, effective communication with the middle ear was assured by

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turning on the current of medicated vapor and using the otoscope. The patient then held the catheter in position with the thumb and second finger of the hand of the opposite side, the first finger resting on the nose. Test again with the otoscope, remove same, and have patient insert the ear-piece with hand of corresponding side. The operator now turns on the medicated vapor, and grasps the tube which conveys it with the left forefinger and thumb, while working the shut-off with the right hand.

By making simultaneous pressure with both thumbs the air is turned into the external canal through the shut-off, and the vapor prevented from entering the catheter by compressing the vapor tube. Upon releasing the pressure, the opposite condition supervenes, *viz.:* the vapor rushes through the catheter and the air is shut off from the external canal. Thus we have the pressure applied alternately upon opposite sides of the drum membranes; which would seem to be more effective than upon either side alone.

The lumen of the external tube is much greater than that of the catheter, and the access to that side of the membrane much more direct. For this reason the patient should be instructed to insert the ear- piece at first somewhat loosely, and at no time to make the connection tight enough to occasion pain or discomfort. I have at no time used over seventeen pounds pressure (the degree of water-pressure in my automatic pump), and for one of my patients I have found it best to reduce the pressure to five or six pounds.

I have not used this method of massage sufficiently long to speak with any degree of confidence in regard to its effectiveness, neither do I claim that the method of application is other than crude and elementary. If it has been previously suggested it has not come to my notice.

In three of my cases I have given it a trial of from one to two months. They are all cases which had been under treatment for several months, and had all shown improvement as the apparent result thereof before being subjected to the treatment under consideration.

Case One.—Mrs. S., catarrhal deafness of several years' duration. Preliminary examination showed hearing R. E. for watch, 0: hoarse whisper, 1 meter. L. E. watch 5 in. Tinnitus, constant in R. E., intermittent in L. E. Up to the time I adopted the masage I had succeeded in improving the hearing to the following degree: R. E. watch ½ in.; hoarse whisper, 6 meters. L. E. watch, 12 in. This was accomplished by daily treatment of middle ear with vapor inflations; reduction of hypertrophic inferior turbinated membrane; enucleation of a submerged tonsil and cauterization of enlarged lingual tonsils. After

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adopting massage, I also dilated the tubes, using a "D" violin string as bougie. This measure contributed definitely to the improvement. The final test, after using massage twice a week for a month showed R. E. watch, 5 in. L. E. watch, 24 in. These results were constant for the last two weeks of treatment.

Case Two.—Mrs. N. Had been annoyed by increasing tinnitus in R. E. for six months. Hearing in that ear, watch 12 in. The first step in the treatment consisted in removing from the nares corresponding to the affected ear a long septal ridge which nearly occluded the passage. From that time up to two months ago she was treated two or three times a week by the usual methods. The tinnitus was aggravated by the air-bag and the catheter, and none but the most gentle local measures could be used. The intrnal administration of *Cimicifuga* tincture seemed to have a modifying effect upon the tinnitus. I tried the massage upon this case. She could only bear about five pounds pressure without bringing on an aggravation. I finally abandoned it, and at present am using inflation through the nose with the nebulizer. The tinnitus fluctuates. Is at times much better, and then returns, but in a modified degree.

Case Three.—Mr. J., railway mail clerk. Car gets very hot, and then he has to open the door to throw out a bag. Consequence: frequent colds affecting the ears. L. E. has been deaf for years. R. E. recently affected. He had been under treatment for several weeks with encouraging results when he contracted a very severe case of La Grippe, which especially affected the upper respiratory tract, and left him decidedly deaf. Upon resuming treatment he could only detect the acumeter at three inches with either ear. His business is such that it prevents his coming for treatment except every other week. For two months he has received massage regularly, three or four times every other week. In the past week his progress has been encouraging. He now hears the acumeter four feet with R. E. and one foot with L. E.

DISCUSSION.

Dr. Houghton: The essential features of functions of the middle ears involved in a study of this paper, have been fully considered in the paper just read by me; hence let us turn at once to the practical side of the subject. I said in my haste "Solomon was in error; there is something new under the sun, and Dr. Kellogg has found it, but a few days later one of my colleagues told me that a physician in Cincinnati, O., had devised a method of doing just what we have proposed to do, by slightly different technique. It would seem to argue that modern psychology is correct when it claims a common source of knowledge; original work is merely drawing from that source. Three students may tap the fountain at different points at or about the same time.

Dr. Kellogg's technique strikes me as admirable in dealing with recent cases. I shall make a comparative study of his method and of that suggested in my paper. There is one fact that will militate against the

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adoption of the practice suggested in these two papers. When Mr. Wappler showed the apparatus presented to us to-day, to a member of the so-called regular school, he said it was a good thing, but it was a pity that it came from our school; the particular form of words used was more pungent than pious. This is in keeping with history as regards internal remedies, such prejudice must yield because of the merit of aural massage, but due credit will hardly be given us, on surgical lines when it has been denied for over a century on medical ones.

There is only one other ground on which adverse criticism can be made, and that the author has guarded; these methods are so new that we must be watchful; the catheter and Politzer's method of inflation have been abused. I have come to be very cautious in their exhibition, having seen membrana tympani made lax, beyond hope of restoration by inflation, hence, I never allow Valsalva's method practiced without closing the external meatus.

While there is a gain by applying the force directly to the mouth of the Eustachian tube, in some cases, there is also a loss in another sense; because the massage of the nares, and vault of the pharynx is eliminated; this is a very important factor in treatment as the catarrhal disease of accessory areas, is the basis of the middle ear disease. An active condition induced by the massage will give new symptoms for our study, and the internal remedy will be one indicated by these very symptoms. A paucity of symptoms has been the bane of chronic aural catarrh.

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AURAL MASSAGE.

By Henry C. Houghton, M.D.,
New York.

Definition.—Massage is the act of manipulating the body in such a way as to modify its function in part or as a whole. The word is from the Greek "to knead," through the French (ma säzh'), *masseur*, (ma ser'), masseuse (ma sez'), terms applied to persons who practice the art. Sometimes incorrectly applied to a machine. General massage is produced by kneading, striking, vibrating, rubbing, and other modes of moving the tissues of the body so that the arterial nerves, lymphatic circulation, is changed, as the ganglia and terminal nerve filaments are stimulated, thus affecting the entire nervous system.

Nature and Scope.—Aural massage is of the same nature, has the same purpose, and, in a limited sense, the same scope. A brief study of the anatomy, physiology, and pathology of the ear, will convince the unbiased mind that it is as valuable locally as it is generally.

Audition is the function of reception, conduction, and perception of sound force; the perfection of this function depends on the integrity of the external ear for reception and synthesis, the middle ear for conduction, the internal ear for perception. Pathology shows us that it is the function of the middle ear that is specially increased by massage. Catarrhal disease of the middle ear, either alone or leading to suppurative disease, is the cause of the great majority of cases of deafness. Alone, it causes in the hypertrophic form of disease such thickening of mucosa, and increase of secretion, that sound-waves cannot reach the internal ear; in suppurative disease the mechanism of the middle ear is so changed in its relation, that the same is true of the function. Even if suppuration cease and the condition come to be classed as catarrhal again, the consequences of suppuration are like in kind with those of simple atrophic catarrh, adhesions, pseudo-anchylosis, etc.

Toynbee was the first writer to do any extensive work in showing the actual condition existing in these cases, and his collection of preparations of the middle ear are his best memorial. During the last quarter of a century a more advanced step has been taken by our English and Continental aurists, by joining the clinical history with the post-mortem

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study and preserving the specimen for our study. From these, we can draw general conclusions as to the probable mechanical conditions existing in the mechanism of the tympanum of any case with similar clinical history.

Not to dwell on this item, we find in atrophic cases either simple or complicated by a history of suppuration, dense adhesions between the drumhead and the ossicula, between the ossicula themselves, or between the drumhead and the inner wall of the tympanum; threads, bands, dense masses of scar-tissue, etc. Hence, the sound-waves cannot reach the internal, save in a limited degree. Aural massage does for this mechanism what general massage does in a similar anatomical relation—the shoulder, arm, forearm, hand. Place the first at the shoulder on the same side and you have a parallel relation. What passive motion does for the greater, aural massage does for the lesser.

History.—Aurists have sought for some means of causing passive motion of the drumhead and ossicula. Siegel's otoscope, designed for diagnostic purposes, came to be used by many, Lucæ's pressure-probe, Delstanche's pump. I, myself, used Siegel's otoscope with alternate action from a breast-pump, and made a series of trials of apparatus for massage, devised by the late Geo. H. Taylor, M.D., well-known in this city as an advocate of the Swedish system. No special advance was made till Dr. Maloney, of Washington, D. C., devised his otophone. Even then, the device was not appreciated till Dr. Garey, of Baltimore, gave a wider use to a vibratory diaphragm, using a stethoscope with the phonograph. In March, 1892, I visited Dr. Garey at his clinic, and have given, in a previous paper, my views of the matter.

The phonograph served well its purpose, and still gives, in a limited way, more than any one instrument, as one can get great variety of vibration from it by changing cylinders. Dr. Garey turned from it to his vibrometer, in the attempt to combine tones and noise, but my experience is in keeping with those who abandoned it for an instrument capable of producing tones. Dr. Wilson, of Meriden, Conn., Dr. Bissell, of Rochester, N. Y., utilized the guitar with uniformly good results. I turned my attention to the organ, and succeeded to my satisfaction, till now I have four, illustrating the doctrine of evolution; as well as dispersion of filthy lucre. By the use of single tones, chords and simple harmonies, one can bring the auditory nerve to perfect function, as the function of the middle ear improves.

Since the utility of aural massage has been demonstrated, instruments have multiplied, and there is no doubt that by united effort, some

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device more simple and effective will be devised. In another place, I have given results obtained by combination of faradic energy combined with diaphragm vibrations. Dr. W. R. King, of Washington, D. C., devised a similar apparatus. In the April number of the *Journal of Ophthalmology, Otology, and Laryngology,* I offer my colleagues a somewhat limited experiment at widening the use of the pump as a means of doing the pioneer work in aural massage, specially in very difficult chronic cases. In 1895, Dr. H. E. Waite made for me a pump to be run by a small electric-motor; the rapid condensation and rarefaction of air was communicated to the drumhead by a stethoscope, as in similar efforts at massage, the effect being very much like that produced by Siegel's otoscope or Delstanche's instrument. Later, a similar instrument was brought out by an aurist in Pittsburgh, Chevalier Jackson. Dr. Waite afterward improved the plunger, and I found it valuable in suppurative cases, but it was not until last September that I realized my ideal in a plant built upon specifications given to Mr. Wappler, of the Wappler Fayer Co., of New York.

Since the above-mentioned articles were written, my attention has been called to the instrument devised by Dr. Stephenson, of Lowell, Mass., which is similar in character, and from the use of which Dr. Stephenson and others have obtained excellent results.

Methods.—Whatever devices have come to be used in the seven years covered by the history just given, the method has been to cause vibration of the drumhead and ossicula by sound force conveyed to the tissues of the canal and membrana tympani by the column of air contained in an ordinary stethoscope. The only exception, so far as I know, is that of the direct application of force by a pressure-probe (Lucæ) or some rapidly vibrating probe, having a lateral motion such as is used in massage of the nares. There is nothing specially new in this direction.

Last autumn, soon after my plant was put in by Messrs. Wappler and Fayer, while using the blowing action to force an insufflation, I was able to open the Eustachian tube by a succession of gentle impulses. This led me to the study of phonation as I had done with the organ tones, the idea being suggested by Dr. Lowenberg, of Paris, in an essay on the "Physiology of Vocal Tones," which he kindly sent me. By using a suitable nasal tip, one can convey to the entire tissues of the nares, naso-pharynx, Eustachian tube, and middle ear, the vibrations of the column of air in the tube attached to the pump, and can modify the same as the pharyngeal muscles are brought into action by

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vocal sounds; *ah, oh, e, ou* give a different vibration, the first two acting to produce the vibration more in the nares, the second two cause vibration back and into the middle ear.

I have been surprised at the uniformly favorable testimony of patients to this entirely new departure. I do not think it is psychic. I trust my colleagues will make reports on their observations, that the truth may be reached; one observer may be biased.

Results.—In another relation I have given my views of the effects of massage. I need not go into that matter now, as we shall not disagree as to the effects, or how they are produced, but there are one or two points on which it may be well to enlarge. It is my conviction that simple noise does not suffice to restore audition to normal standard; it does the rough preliminary work, but must not be pushed too far. There is too much noise in the world, too little harmony. We need to have modulated tones, and musical tones follow noises with good effects leading to the perception of the modulated tones of human speech. While this is true, passive motion by some device, which acts as does Siegel's otoscope, is more effectual in overcoming rigidity of the middle ear mechanism, than is sound alone; still, the sound made by a pump, run at a high degree of speed, is not a disadvantage, but rather otherwise.

In the earlier study of aural massage, the aim was to secure succussion of the mechanism, and when the pump came to be used, we dealt with the catarrhal form of disease, finding the instrument valuable in cases in which there was a history of previous suppurative disease. In my own experience, the fact of its great value in suppurative disease, was rather a surprise, from observing cases in which there was suppurative disease of one ear complicating the catarrhal disease in the other ear. Later the pump has been used in all suppurative cases. When Dr. Winslow told us at Deer Park of the unique results gained by suction in a case of suppuration involving the attic we little thought of the wide scope of that simple act! Massage by suction giving more brilliant results than any other phase of this treatment, transforming a chronic, indolent condition into an active repair in a few days.

Dangers.—Every force for good may be turned to evil uses, so of aural massage. The advice of the great artist was good, "mix your paint with brains"; exercise caution in all cases. I am positive that one may cause concussion of the auditory nerve by long-continued, frequently repeated noise produced by some machines used for aural massage; indeed, the deep organ tones may be used to excess. Heroic

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dosage is to be avoided in bringing to action upon the ear any form of energy whatever; this is true of galvanism, faradism, the static, and it must be true of sound force. Any pump that is capable of doing the work needed in very rigid tissues may do harm. This is true especially in suppuration; in a number of cases slight hæmorrhage has been produced, even while watching the effect, and the result was all that we could desire, because measures were taken to keep the tissues clean, and a remedy given which controlled the condition. In one case, a patient whose cerebral gray matter must be more dense than his mucosa, disobeyed directions while under close watch and care, and I was obliged to remove the stethoscope from his ears with my own hands. Ecchymoses of slight area were made in the cutis of the external meatus; but the drumhead was only slightly congested, and the middle-ear condition was made better by this radical treatment. One can infer what might occur in dealing with slight neoplastic tissue. Hence, be very carefui that your pump is adjusted before starting. The same is true of my method of massaging the middle ear *via* the Eustachian tube. As the air pressure that forces the tissues of the anterior nares apart may be stronger than is needed to force the Eustachian tube during phonation, one must be careful not to be in haste to force air through the nares; let the action there be continued; it is very beneficial; it is quite as important to reduce the mucosa of the nares, as it is to fire open the Eustachian tube; other things being equal, if the nares are well open, we have no trouble at the Eustachian tube.

Therefore, let the vibration of the middle ear be gentle, except perhaps in old cases with very rigid mechanism.

The following cases illustrate some of the later phases of aural massage; the earlier experiences are undoubtedly familiar to all my present audience, and need no comment as to technique.

One of each of the usual types of disease will be enough to illustrate my new method.

Case One.—Mrs. S., age 50.

Diagnosis, Otitis media cat. chron. First seen, Sept. 29th, 1873. R. failed one year ago. H.D. watch, R. $^{5}/_{240}$, L. $^{20}/_{20}$, canals clear. R. Mt. depressed, adherent; L. normal. Pharynx, thin tissues, but not specially abnormal; slight secretion of thin white mucus; subjective puffing. Unded faradic current and auto-inflation, she gained in six months to, R. $^{10}/_{20}$, L. normal. During the next two years she kept nearly that degree of function, then became discouraged. I saw her only occasionally during the succeeding years. Sickness, loss of her husband, a hard

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struggle in life, were factors that kept her depressed till she became very deaf for voice.

Feb. 17th, 1899, she came on one of her occasional experiences of headache from acute catarrh, with increased subjective noises, and was induced to come for treatment regularly. The result has been remarkable. The perception of all noises has increased, so that she hears them promptly, and at a distance; also musical tones, but modulated tones are not as well recognized; some tones are clear, others seem muffled, and the mental concept of tones that are not clear, is very tardy; later, it dawns on the patient. Certainly, the present status is one not anticipated at the outset of the treatment, four months ago.

Case Two.—Mr. W. M. C., age 22, Oct. 19, 1895.

Diagnosis, Otitis media sup. chron.—History, measles when a little child. Both ears discharged; then healed; since then deafness has come on with colds.

Present state. H.D. watch, R, $^{1}/_{240}$, L. $^{2}/_{240}$. Canals clear. Mt. scarred, irregular, immobile. Pharynx adenoid. Nares hypertrophic. Ett. dilatable. Has been suffering for days with acute catarrh, but the ears have escaped.

Under *Ferrum phos.* for acute conditions and *Hepar* for suppurative exacerbations; he made good progress. Four months later, R. $^{2}/_{20}$, L. $^{1}/_{20}$.

June, 1898. He was seen only from March to June and maintained good condition.

Nov. 17, 1898. He was seen, having got cotton too deep in meatus, while cleaning the left ear; but could not be made to realize the need of attention.

Jan. 23, 1899. He came and followed up treatment with more regularity, the secretions being removed by suction, as before.

Feb. 16th, R. Mt. came forward and L. Et. opened, and tissues were quite free from moisture.

March 24th. Perf. clearly defined; masses of white cheesy pus were dislodged from pockets. Tissues more normal.

May 18th. Canals and memb. tymp. quite clean, slightly moist, but not purulent. Perf. (L) a mere pin-point, H.D. watch $^{20}/_{20}$ R. and L. diff.

Case Three.—Mr. J. A. B., age 52.

Diagnosis, Otitis media cat. acuta.—History, ten years ago had abscess in L. from cold. Two years ago, similar attack. Perfect recovery, which I question.

May 17th, 1899. After riding on a bicycle when weary, had sudden pain in left ear. Telephoned for afternoon appointment, and came in pale, depressed, in intense pain. L. canal bathed with bloody serum. Mt. congested to an extreme. Pharynx angry red, thick tissues. *Ferrum phos.* 2x every ½ hour and *Gelsemium* 7c, when pain lessened.

May 18. Better before midnight; same appearance, and slight perf. same remedies. Seen daily for one week, when the rapid improvement warranted an outing over Decoration day.

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On May 25th, I was able to massage the ear by suction as well as blowing, and on May 31st, the perforation was closed; it did not yield to quite forcible massage.

June 4th, the congestion had nearly disappeared, and the outlook is that the ear will become better than for years before this attack. *Lesson* Treat acute cases with the purpose to secure better conditions, before the tissues return to their former rigidity.

Case Four.—Mr. C. S. P., age 50.

Diagnosis, Otitis media sup. acuta.—May 15th, 1899. History, strictly classed, this is a case of chronic suppuration presenting symptoms of a more active sort, due to neglect. Patient was first seen Feb. 10th, 1881 when, after head cold, acute otitis set in, affecting both ears. When a child, scarlet fever was complicated by otitis.

Some weeks since was called at night to see the patient at his residence, and gave relief; now another alarm, at finding the right ear closed, precipitates a call for relief.

The present state is soreness and tumefaction of R. canal, and entire cartilage extending into soft tissues, before and behind the auricle. The canal is nearly closed by a mass of tissue, cellular, bleeding easily and mobile on a base which seems to be posteriorly secured. The canal was cleared as fully as possible, and equal parts of vaseline and ether applied, after touching the granulation mass with sulphuric acid. *Hepar sulph.* was given internally. Three days later the mass was curetted and the base touched with acid; the next day the ear was thoroughly syringed and massage by suction and blowing used, with immediate relief; but no opening of Et. since then three treatments each week have been given.

To-day, June 5th, the drumhead is nearly free from moisture and becoming more clearly defined; the air passed freely to both tympana, and the patient says he hears better than he has been able to do for many years. As he proposes to make a trip to Europe July 1st, to be absent three months, I shall make an exact record of the degree of acuteness of function just before his sailing, to compare with the future reports.

Relief from acute conditions was the impelling motive for treatment not increase of function.

The adage of the new broom is not out of my mind. This is an age of fads. But I am free to admit that this latest phase of massage, has more of promise in it, than any form of local treatment which has come to my hands. since 1867.

DISCUSSION.

Dr. King: I have been interested more or less of late in the experimenting and using new instruments. I have not gone very exhaustively into experiments in the line of what is quite properly called pneumatic massage. The method of massage by sound waves, the so-

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called phono-massage of Dr. Stephenson, has been a little more in my line because my past experience was with the otophone, of which Dr. Houghton has just spoken, and the phonograph and later with the vibrometer. Other matters have taken precedence of this with me of late, but Dr. Stephenson and Dr. Houghton are continuing the experiments, I am glad to note, and are advancing. I have not lost my interest, however, in the matter; and, from what we have seen to-day, I believe that massage by phonation and air force are both necessary, at least in some cases. Either one may be necessary in any single case; both combined in some. I think that the advances made are going to be permanent at least to a degree. I think we are progressing in the right direction, and are obtaining some relief. There are certain cases that nothing else, in my experience, has been able to benefit one particle, that have been benefited in varying degrees by some form of massage. I do not believe we will ever find a method that will be applicable to all cases, any more than we will find any one remedy applicable to all cases. All these experiments and this practical study in the line of aural massage is of undoubted benefit and will aid us along a line that has been the bugaboo of every otologist—the treatment of these chronic cases of deafness, particularly of the catarrhal type as well as in chronic suppuration. I had the pleasure of seeing this instrument demonstrated at The New York Medical College and Hospital the early part of the last month. Dr. Houghton presented there a patient, one of the cases which he has reported who has been through the line of treatment with the older instruments for quite a while and had obtained practically no benefit during the twenty-five years, the doctor tells me, that the case had been under observation. The patient reported to him for an acute exacerbation. Under the treatment with this new instrument through the outer ear and the Eustachian tube (as suggested in the last remarks of the doctor) the amount of improvement gained was quite remarkable.

With the instrument of Dr. Stephenson, I am not so well acquainted. The instrument is now in a much more perfect condition than it was when presented before this Society last year. The doctor is practically following the same line in his instrument as Dr. Houghton has with his except that it has a phonetic massage along with the pneumatic. I am watching these experiments with a great deal of interest, as I think everyone is. There is no question but what we are helping many cases we could not before benefit. We are failing, to be sure, in some cases to get the relief, we desire, but mechanics are going to be of considerable assistance here, because as the result of the original cause of these conditions, we have mechanical difficulties to overcome. I understand from Dr. Stephenson that the Section on Otology of the American Medical Association took up the matter of aural massage quite extensively at its recent meeting, and that some of the men are doing a good deal of experimental work in this direction. For a long while they did not do anything in the way of massage because the first practical application of this idea came from our school, and they are a little

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chary about taking up even mechanical methods of treatment that we advance.

Dr. Houghton: For cautery work in the nares, larynx or for use in general surgical work this is a most excellent cautery. The unique thing about this apparatus is that any electrician could put it in shape as an office plant. It is the pump, however, which is the unique feature. I came to be satisfied that I could get better results by what is ordinarily known as a 3-way pump and drew a sketch of one which is not at hand now, in which I purposed to shut off the current on one side by a stop-cock, and let the current through from the other side. There was also a third stop-cock at the Y to be reversed: that is, I arranged it just as one would for a three way service. I went to Mr. Wapper, and he constructed this pump, which is one of the very best arrangements I have ever seen. By changing the bed-plate into either one of three different positions you get three different actions. In this position (it is now moving in the middle position) it alternately flows and exhausts, and it may be so regulated that the action is very rapid, as high as 800 movements per minute in the middle position or even faster, but it is not necessary to imperil the instrument by such rapid action. The motor is on a rheostat, and by a simple motion the pump can be stopped. All the gradations desired can be made by the regulator. In fact, the mistake is often made, I think, by running it too rapidly. This illustrates the three movements you can get from the instrument, 1st that through the stethoscope—the suction— 2nd the blowing action, and 3rd the alternate suction and blowing action.

In using the blowing motion, with the apparatus here shown, you have the instrument by which the phonation, of which I spoke in the paper, is utilized. This is a separate device connected when the stethoscope is used. The air is driven through the same tube which is put into the anterior nares. Then, as the patient phonates, the air passes through the nares and Eustachian tube to the middle ear, as I will be able to demonstrate to anyone interested in it after the session.

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THE POINT OF VIEW.

By John L. Moffat, M.D., O. et A. Chir.,
New York, Brooklyn Borough.

NOTWITHSTANDING the opposition usual to all advances in the world's progress the makers of microscopes were at last induced to use a common screw-thread.

It is the purpose of this paper to suggest that every illustration of the fundus oculi be accompanied by a note indicating its amplification, or, better, the distance at which it should be held from the eye in order to give the proper sized retinal image.

A landscape photographed with a twelve-inch lens appears best when viewed with one eye at the distance of a foot, that taken with an eighteen-inch lens from a foot and a half; similarly, the student will derive most benefit from lithographs, etc., of the fundus if they appear to him the same size as if he were looking into an eye—especially is this so in regard to estimating the caliber of the blood-vessels.

Comparing half a dozen or more of our leading text-books, I found the horizontal diameter of the optic disk measuring all the way from 7 mm. to 30 mm.; frequently on the same page one drawing was upon twice the scale of another. These differences are not due to physiological variations, nor to the fact that the small were inverted, and the large erect images, but are attributed to thoughtlessness.

Let us, hereafter, have uniformity; it certainly is practicable to make each drawing of the fundus appear in detail, and in toto the size of the inverted or of the erect image when we view it through our ophthalmoscope with its correcting lens held as during examination of the eye.

Thus would give accurate uniformity in the caliber of the blood-vessels make the lithographs doubly valuable to the specialist, refreshing his memory for cases of doubtful dilatation or constriction.

A material help in the accomplishment of this end will be for every reviewer to commend this feature, if present, and to criticise its lack, in future atlases and text-books.

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A CASE OF OSSIFIED CHOROID, WITH PATHOLOGICAL SPECIMEN.

By John N. Payne, M.D.,
Boston.

THE case that I present to-day is to me a most interesting one; and I believe it to be an unusual one on account of the extensive pathological alterations that have taken place. I have found mention of such possibilities in several text-books, but a report of only one individual case in the current periodical literature that I have at my command. Dr. T. H. Wood of Nashville, Tenn., describes a similar case in the Archives of Ophthalmology, Vol. XIX., No. 4 (1890). The late Dr. H. W. Williams in his book on "Diseases of the Eye," published in 1886, says, following a short description of "Osseous formations in the choroid," that he has in his possession a completely ossified choroid which he encountered in operating for the removal of the anterior part of a staphylomatous globe, and which he extracted with forceps, subsequently bringing the cut edges of the sclera together with sutures so as to form a good stump. My case seems to differ from both of these in the involvement of the lens, as well as the choroid and ciliary body, in the calcareous degeneration.

I speak of it as a degenerative change, because there was no evidence of the choroid remaining in this case, but simply the sclera on one side, and the retina on the other; the ossified plate having apparently taken the place of the choroid. Dr. George A. Berry of Edinboro describes it in his text-book as an exudative choroiditis, involving only the inner or capillary layer. He says, "it appears certain that the bone forms in the exuded matter, and not in the original tissues of the choroid," also that "it does not in any way differ from the development that takes place from periosteum," and that the formation always "ceases at the border of the *ciliary body, in which ossification never takes place.*" This case that I have here to-day, together with its pathological specimen, would seem to have involved the ciliary body as well.

Dr. Berry (and I quote him particularly, as he seems to have given more space to the consideration of this subject in his text-book than

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others, with the possible exception of Norris and Oliver), says, furthermore, that he has "always seen an aperture left at the position of entrance of the optic nerve, but it is said sometimes to be bridged over." You will notice in this specimen of mine a minute circular aperture of a little less than one mm. diameter just at the point of location of the optic disc, which I believe was left open for transmission of the retinal vessels, thus not completely bridging over the optic disc space. He mentions a case recorded by Lacquer, where, "After the extraction of a dislocated calcareous lens the media were found to be sufficiently clear to admit of ophthalmoscopic examination." "In this case," he says, "no trace could be seen of the optic nerve or retinal vessels, and the appearance altogether seems to have been very remarkable, while the diagnosis of ossification of the choroid was confirmed by palpation." It was impossible to make an ophthalmoscopic examination in this case, as the pupillary opening was obstructed completely by the ossified lens, which I was unable to remove.

This condition seems to be in most cases a result of irido-choroiditis that has caused a shrinking of the whole globe, with subsequent osseous formation. My case presented no such evidence of shrinkage, but rather it appeared as an ordinary eye with moderately contracted pupil and calcareous lens, and with some conjunctival injection.

Believing that the history of such a case with exhibition of the pathological specimen, might be of interest and instructive to many of you, I have ventured to present both to-day.

Case.—My patient was a man of forty years of age when he first called to consult me, May 18, 1894. He was absolutely blind, and gave the following history: His right eye was injured by a base-ball when twelve years of age, April 10, 1866, and its sight was immediately lost. His left eye became inflamed through sympathy two days later, and gradually lost its vision until it was reduced to a mere perception of a point of light by January of '67. On the seventeenth of that month his sight returned suddenly to his right eye (the one injured), so that he could read a book, and could tell colors and objects for about two hours, until he went to bed. The next morning he found it reduced again to a perception of large objects by sunlight, whereas he was almost absolutely blind by artificial light. This continued until July of the same year, when his vision suddenly disappeared for good.

When he presented himself for examination, I found the following condition: Right eye of normal size and free from outward evidence of inflammation, except for a circum-corneal injection such as is seen in iritis; the anterior chamber somewhat shallow; the pupil dilated and adherent posteriorly; and the pupillary space filled in by a dense, yellow-white, evenly distributed, mass that was evidently a calcareously

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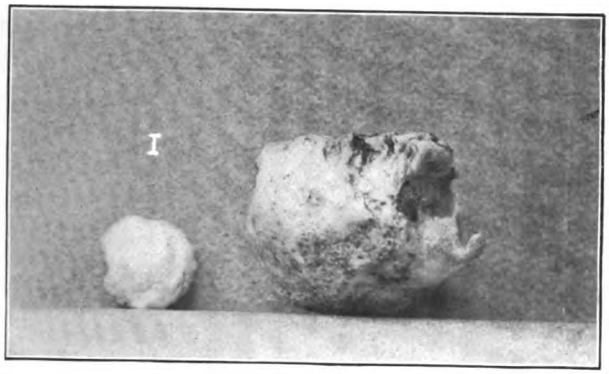

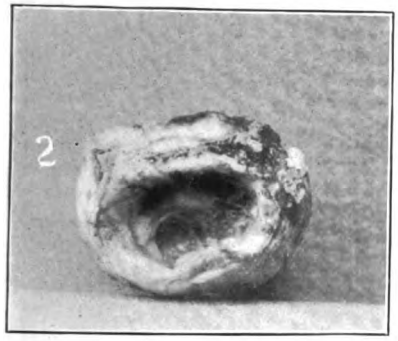

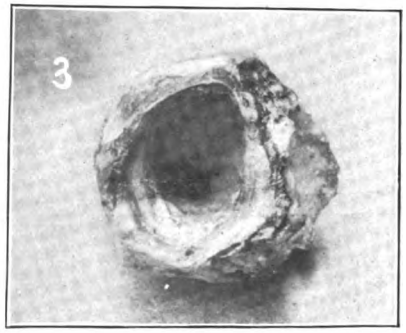

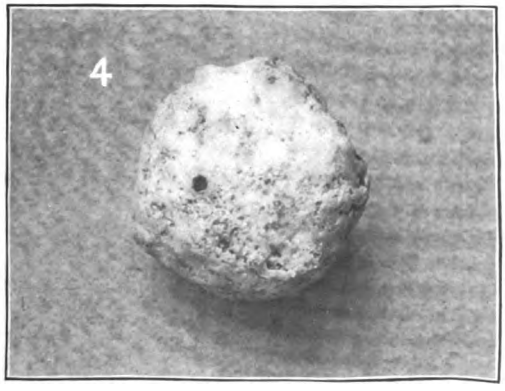

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degenerated lens. Its tension was a strong plus, and it was rather sensitive to pressure, I thought, though the extreme over-sensitive condition of the whole nervous system made it doubtful as to whether his shrinking from contact was due entirely to the local irritation. His left eye was blind, pupil contracted to pin-head size, completely adherent, and blocked by exudation. The tension of this eye was somewhat below par, but it presented the same circum-corneal injection. He complained of a constant, intense pain in one eye or the other almost crazing him, and had for this reason sought consultation. I advised enucleation of the right eye as the only possible remedy, but he begged me to try first extraction of the lens, so that he might have a chance for his vision, and I consented with the understanding that I should be allowed to enucleate if I found the condition hopeless. He was put into the hospital and the usual incision made through the cornea under general anæsthesia, and an attempt made to extract the lens, which, as I anticipated, was futile. I passed a probe under the lens to loosen it from its attachment, and to lift it out, but found that it rattled against a bony plate all around, and evidently was in contact with an ossified ciliary body. I enucleated the eye, and on section of the sclera found the pathological condition that I present to you to-day, and that I have embodied in this paper in a series of photographs that represent an enlargement of about four times the original specimen.

You will notice that the ossified shell is thicker in parts than in others but represents an average of about 1 m.m., and that it involves nearly the whole choroid, and all of the ciliary body, and all of the cribriform plate with the exception of a circular aperture just large enough to admit the arteria centralis retinæ and its vein, and that the crystalline lens is also completely ossified. I have said "nearly the whole choroid," and by that I mean with exception of the large opening that you will notice on one side, and which measures 10 m.m. in transverse diameter, and 5 m.m. in perpendicular diameter. This I have explained by a possibility of the choroid having been ruptured at the time of the blow, and that this represents the rent made then. The vitreous had become liquefied, and the retina still remained as a lining membrane of the choroid, but the latter had entirely disappeared. The enucleation was followed by a great amelioration of the pain in each eye, but not an entire cessation. I have seen him within the past three months, and have found the left eye looking just the same with the exception of the circum-corneal injection which has disappeared, and a little more chalky appearance of the pupil, and with tension still minus. He has an occasional attack of pain in the stump of his right eye, though it does not look inflamed, and this pain will also extend to the left eye at times. Says it seems to him like a very much modified and expurgated edition of the old pain. No sense of light except when he is feeling particularly well. Smokes a great deal and is nervous and intense, but otherwise well. Is slightly rheumatic, and once had rheumatic fever years ago. Has occasional attack of pain in right shoulder, and numbness and powerlessness of three first fingers of right

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hand, soon disappearing, but leaving for a long time numbness of right index-finger. Carpal joints somewhat enlarged but freely movable, and not over-sensitive. I have no record of having made an examination of his urine.

I have no explanation to offer of the cause of this peculiar condition, but have simply presented the facts, hoping that some one of you, who has had a similar experience, may have found the true explanation.

DISCUSSION.

Dr. T. P. Wilson: Dr. Payne's paper is certainly full of interest. It is a *rara avis;* and may well be placed among the curiosities of medical literature. It does not admit of much discussion for, unlike the fabled shield, it has but one side. "The extensive pathological alterations that have taken place" are stated with admirable clearness but I do not share in the hope of the author, that any one has found or will find "a true explanation" in the sense intended by that phrase.

As related to general pathology, the case it seems to me takes its place among the many recorded cases of so-called ossific deposits in various parts of the human body. As to their relative frequency in the different tissues, I have no means at hand for judging. It does not matter, however, as we are concerned only in the fact, that some of the tissues of the eye are prone to this form of degeneration. That such cases are rare I judge only from the fact, that I have seen only two such and they were confined to the lens.

The separation of the various salts of the blood, is an ordinary physiological process, as we know in the case of urinary products. Under pathologic conditions, they escape into tissues and build up concretions without special form. In other cases they follow the laws of nutrition and displacing normal tissues, assume their form. I do not know of any reason for this.

Such cases have been successfully treated, when occurring in parts of the body other than the eye. I mean various concretions have been removed by internal medication. If we could detect the diathesis which leads to these results, might we not hope for something from preventive measures? If left to surgery, the treatment is plain enough.

Dr. Hasbrouck: I have had a similar case to that of Dr. Payne with a very interesting history of the early conditions. He first appeared to me applying for a pension, claiming that he had lost the sight of his right eye from moon blindness without the history of any wound. On examining the eye, I noticed a calcareous lens, and feeling of the tension, found the globe like a stone. He was complaining of severe pain in the eye, extending to the back part of his head. It looked like a case of old irido-choroiditis that had run its course without treatment. I removed the right eye. On seeing the title of Dr. Payne's paper, I tried to find the specimen but it had been lost. It

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was so like Dr. Payne's that I wish it could have been presented at this meeting.

Dr. Moffat: I would like to ask if there was any probability of these patients having lived in a region where the water for drinking was lime-water?

Dr. Hasbrouck: Possibly. My patient is a colored man at present driving a coal-wagon, and previous to this he lived in the South. I believe there is considerable lime-water in the South.

Dr. Payne: I regret very much that I neglected to have a urinary examination made. The patient's joints are somewhat outgrown, but they are movable and this seemed to be the only trouble he had had so far as I could judge, being perfectly well otherwise, and I regret very much not having had an examination made to determine the lithæmic state.

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WAS IT A CASE OF SUB-RETINAL CYSTICERCUS?

By E. H. Linnell, M.D.,
Norwich, Conn.

THE occurrence of a cysticercus, the larval stage of a tape-worm, in the human eye is of rare occurrence. It is more often seen in Germany, where raw pork is eaten, than anywhere else, and an idea of its frequency may be had from the following statistics: for instance, Von Graefe saw eighty cases in eighty thousand patients, or one in one thousand. Hirschberg saw, during the short space of six months, two thousand one hundred new patients, of whom five had a cysticercus, or one in four hundred and twenty. Mauthner saw none in thirty thousand patients. In the United States it is almost unknown. Loring in his "Text-Book of Ophthalmoscopy" alludes to one case reported in the *Medical Record* for December 27, 1889, by a Dr. Minor, as the first and only case noted in this country. In view of its exceeding rarity, therefore, the record of a case is of interest even though the diagnosis is not entirely positive, and I offer the following history as unique in my experience and as *probably* a case of cysticercus. I do not say of cysticercus cellulosæ, because the beef-worm or the tænia sagginata is much more common in this country and therefore the cysticercus bovis would be more likely to infest the eye of an individual than the cysticercus cellulosæ of the tænia solium. The latter is the only one of which I have been able to find a description in ophthalmological literature, although it has been claimed that the former has been found in the human eye. Probably the description of the one would not vary in essential details from that of the other, as the larval stage of all tape-worms that are found in man is said to be very similar, and to pass through the same stages of growth and development. Therefore whether mine was a case of cysticercus cellulosæ or of cysticercus bovis, I was unable to determine, but as will be evident, it resembled in essential features the appearances described as characteristic of the former.

Before narrating my case, it may not be unprofitable to review the etiology and development of the affection.

A peculiarity of the life of all tape-worms is that they do not

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attain maturity until they inhabit a "second host." The hog, for instance, or the steer swallows the mature segments or the embryos of a worm. These embryos are minute vesicles armed with hooks. They do not develop into worms, but by means of the hooklets, they penetrate the walls of the stomach and the larval stage or cysticerci develop from them in the intermuscular tissue and other organs. Now if an individual eats this "measly pork" or infected beef, the cysticerci develop in his intestinal canal into the mature tape-worms. If, however, in any one of various ways which it is not necessary to allude to here, he swallows the embryos, they do not develop into the worms, but the growth ceases with the larval form as in the case of the hog, and occasionally this larva or scolex, bladder-worm or cysticercus as it is variously designated, lodges and grows between the retina and choroid and perhaps penetrates into the vitreous chamber. It is said to be found twice as often in the former location as in the latter. At first it remains quiescent for a time and then, after losing its hooklets, its growth commences and progresses slowly for a period varying from several weeks to four months. The mature bladder-worm in the vitreous, is thus described by Mauthner:

"At the posterior end is a round cyst-like formation serving as a *receptaculum scolicis,* into which the animal can withdraw, presenting when in this position the appearance of a round whitish body. A small fold marks the mouth of this receptacle. When the animal protrudes his head and neck, the body appears to be sprinkled here and there with calcareous deposits, and presents sometimes a smooth and sometimes a wrinkled appearance. The body decreases in size towards the neck, to which is attached the head, with four flattened down angular projections. A round-shaped snout can be projected from the center of its head, and this latter is provided at its base with a double row of hooklike tentacles which are capable of retraction. Each of the angular projections is provided with a rounded sucking apparatus." This full development can of course only take place in the vitreous.

Becker, in Mauthner's work on the ophthalmoscope from which the previous quotation was taken, describes the earlier subretinal stage as a "transparent cyst-like swelling of a bluish color. Its walls could be seen to bend backwards with a convex surface and to be distinctly separated from that of the retina. A critical examination led to the conclusion that the retina at that point was lifted up from the choroid by an independent bluish but depressed body with rounded contours, the walls of which contained *no vessels. This lack* of *vessels speaks*

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against a *diagnosis* of a *new growth* and in favor of an *entozoon.*"

Of course the animal may die and development cease at any period of its growth, and thus its size and appearance are influenced by its age and the fact of its being alive or dead and undergoing degenerative changes. With these preliminary remarks, I offer for your consideration the following history and hope for a free expression of opinion as to the diagnosis.

Case.—Miss T., aged seventy-five, consulted me May 7, 1895, on account of failing vision of the right eye, which was found to be $^{15}/_{70}$ dif. After dilating the pupil with homatropine the vitreous was found to be fluid and somewhat cloudy, with floating opacities. At the inner side and a little above the optic disc a clearly defined bluish-white vesicle was seen, and within it a dark object. The surrounding retina was detached for about one disc diameter toward the median side. The outlines of the vesicle were distinctly separated from the surrounding retina and no vessels were noticed upon it.

The lady was not seen again until May 22nd when the vitreous was still more hazy, and the outlines of the vesicle were indistinct. No other details of the fundus could be made out.

On June 8th I saw the patient for the third time. The vitreous was then a little clearer and the vesicle had sunken to the lower median part of the retina. I thought it seemed a trifle larger than at first, and what appeared like another smaller cyst was noticed at its median lower edge. I was never again able to see anything behind the pupil.

Iritis developed soon afterwards, and later a keratitis, followed by a glaucomatous attack and finally a cataract.

Such is the meager history of what was to me a very interesting and unique case. I regret very much that the vitreous so soon became too cloudy to admit of a careful study of the ophthalmoscopic appearances, and that even at the first examination it was not perfectly transparent. I feel reasonably sure, however, of the presence of a cyst with dark contents behind a detached retina, from which it was distinctly separated.

It did not give me the impression of a neoplasm, and although not conforming entirely with the classic description of a subretinal cysticercus, I know of no more plausible diagnosis.

DISCUSSION.

Dr. Jas. A. Campbell: Dr. Linnell's paper has been of more than ordinary interest to me for two reasons. First, because it discusses in a very attractive manner, one of the rarest diseases of the human eye, for in this, and in several other lands, cysticercus in the inner

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eye may be regarded as an ophthalmological curiosity of greatest rarity, as stated in the paper.

Again, to me, it is a most interesting topic, for it brings back to me, most vividly, early experiences and observations of my student life, years ago, which I have always regarded as unique. During six months in Berlin, in the Fall and Winter of 1872, it was my good fortune to have seen seven cases of sub-retinal cysticercus cellulosæ, in the clinics of Schweigger, and in the private hospital and large clinic of Dr. Ewers, formerly presided over by Von Graefe. Having full notes on these cases, I do not trust entirely to my memory for comment now. In each of these cases, while they were in different stages of development, the leading well-known characteristics, outlined by Dr. Linnell, were present. In five of them distinct movements of the cysticercus could be made out. Three of these cases were operated on (von Graefe's method), resulting in absolute failure and subsequent loss of the eye. In another case the eye was enucleated, as a painful iridochoroiditis had set up.

The point for discussion in Dr. Linnell's paper is necessarily upon the correctness of his diagnosis. In reference to this, we labor under the great disadvantage of not having had the opportunity to examine the case. Under these circumstances, it would seem almost presumptuous to offer criticism, especially since the doctor, himself, almost disarms criticism by his frank suggestion of possible doubts. However, one or two statements may be considered.

Our colleague, following the views of Becker, states that one ground for his belief that his case was not a sub-retinal neoplasm, was because the walls of the cyst-like swelling contained no blood-vessels. This in either case, would depend, somewhat, upon the length of time the elevation had existed, and possibly its position in the fundus. I have seen subretinal exudations and growths, in their early stages, where no blood-vessels were apparent. And, I remember very well, in one or two of the seven cases seen in Berlin, small blood-vessels could be made out running over the cyst-like elevations. And Dr. Schöbl, in his article on the subject in Norris and Oliver's "System of Diseases of the Eye" (Vol. 3, p. 574), describes and pictures one case of a triple cyst, where such a condition is plainly seen. From time to time I have seen small elevations in the fundus, where it was impossible for me to decide, for the time being, just what the nature of the subretinal trouble was—a beginning colloid degeneration, tubercular deposit, subretinal effusion, or primary neoplasm. Progression of the case and subsequent observations, will generally decide these questions, but not always.

It will be remembered that while cysticercus cellulosæ in the eye is most frequently subretinal, it is not a rule or a law, for it has been found in the orbit, in the vitreous, in the cornea, in the lens and subconjunctival, as well as elsewhere.

Cysticercus in the eye, is especially prevalent in North Germany, and is seldom seen elsewhere. During six months in Vienna, not a

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single case appeared, and I could hear of but one case, which had been seen there. Prof. von Jaeger pictures and gives an account of one case in his "Atlas." In Paris and in London not a case was seen during a prolonged stay there, and Schöbl states that in Prague but two cases occurred in 130,000 patients.

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TREATMENT OF SOME AFFECTIONS OF THE THROAT PECULIAR TO SINGERS AND PUBLIC SPEAKERS.

By George B. Rice, M.D.,

Boston, Mass.

IMPAIRMENT of the voice (and the term is used in its highest sense), is occasioned by so many and so varied conditions that no attempt will be made to even summarize the causes. There are, however, special pathological states of the throat which are of particular interest, and to those your attention is asked. In this class may be mentioned the so-called singer's node, to which Türck gave the name "Trachoma"; Rice, of New York, "Chorditis Tuberosa"; while Curtis has adopted the term "Nodules of Attrition."

The affection consists of a small, ovoid projection on the edge of one or both vocal bands at about the junction of the anterior and middle thirds. The nodule may, as has been said, be unilateral, the opposite band presenting a small indentation at the same relative point. The literature regarding the etiology of this affection is meagre in the extreme. Curtis[1] describes the condition as primarily consisting of a bulging of the vocal bands, due to faulty tone production. He claims that long before the nodules appear a tendency can be observed, when the upper voice is used, for them to touch at the junction of the anterior and middle thirds, this spot being marked, on the bands separating, by a small bead of mucus.

Sabrazes,[2] Fuche,[3] Kanthack, and Rice[4] have examined specimens of these nodules and find largely increased epithelial elements, Kanthack finding cornification in one specimen. It has been my good fortune to see a number of these neoplasms, some of them well developed and others in the incipient stage.

Case One.—Miss H., a public singer, consulted me, June 3rd, 1895, for hoarseness after singing with inability at all times to sing the upper notes of the voice softly, this trouble dating some six months previously. The general health was good. The larynx appeared slightly congested

[1] Voice Building and Tune Placing, page 130.

[2] Internationales Centralblat für Laryngologie, 1890.

[3] Ibid., 1893.

[4] Transactions of the American Laryngological Association, 1890.

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in a general way. The right vocal band was reddened, the edge having a roughened appearance. The bands did not adduct perfectly except by considerable muscular effort. (No note is made of bulging.) As the patient was dependent upon what she earned by her singing, complete rest of voice was impossible. I did, however, insist upon the abandonment of all vocal exercises and the use of great care at all times in the explosive use of the upper tones. After three months of quite constant treatment the inflammation subsided to such an extent, that a single distinct node could be distinguished on the right vocal band. The singing voice was much better than formerly, but the upper notes were still husky. I became satisfied that the patient was using the voice improperly, but found it difficult to convince her of the fact. She did consent to give up all engagements for the summer months and to allow me to keep her under observation during that time. The node did not grow materially smaller under the rest treatment. In the fall the patient married and removed to a distant city. She wrote me, eight months later, that under a new singing teacher her voice had so improved that no trace of the former difficulty in singing existed.

Case Two.—Miss C., a public singer, consulted me for recurrent attacks of hoarseness. The nose, naso-pharynx and larynx were normal in appearance. The vocal bands were slightly reddened and catarrhal. It was noticed that on abduction of the vocal bands a bit of tenacious mucus stretched across from one edge to the other. After a few days of treatment and rest, the bands on adduction could be seen to touch at a nearly central point before the edges were made parallel. This remained about the same for a number of weeks. An interval of three months then elapsed, during which time the patient did not come to me. On her next visit, some four months after the first examination, a small nodule could be seen at the junction of the middle and anterior thirds of the right vocal band. This, at first, looked like a small bead of mucus but it could not be brushed away and the voice was persistently husky. After this examination, the situation was discussed and my opinion plainly expressed, with the result that the patient became persuaded that she was using her voice improperly. She consented to change her method of tone production under a competent teacher. The result was extremely satisfactory. Although still obliged to do church and concert work constantly, yet the voice improved from the first and up to the present time the old huskiness and relaxation have not returned, nor is there the slightest trace of a node existing.

Case Three.—Mr. W., age forty-eight, a teacher of singing in the public-schools of an adjoining city, consulted me, January 18th, 1896, for a recurring hoarseness of three-months' standing. It was found that the anterior portion of both vocal bands were congested, the left ventricular band was puffy in appearance, while at about midway on the edge of the right vocal band was a small, hard, pale projection. The nose and naso-pharynx were nearly normal. In this, as in the other cases, rest of voice was impossible. The patient admitted forcing

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his voice and promised to follow my direction in all respects. Certain light vocal gymnastics were given to be followed daily, and the patient was cautioned against pushing his upper tones. By the internal administration of *Mercurius biniodide*—followed by *Hepar sulphur*—and with mild local applications, the congested condition of the larynx quickly disappeared; but the node remained unchanged in appearance. March 6th the larynx was cocainized and the growth touched with a 50-per-cent. nitrate of silver solution. The 6x was also given internally. April 11th, node much smaller. Another application of silver nitrate made, and on May 16th a similar treatment was given. July 17th, growth hardly perceptible and patient says the voice is in better condition than for a long time. For the month previous to this one, complete rest has been possible. A period of nearly three years has now elapsed. The patient was seen on the 4th of March, 1899, and no trace of the growth was apparent.

Case Four.—May 27th, 1895, Miss B., one of the principals of the Grau Grand Opera Company, consulted me for hoarseness of some months' duration. On examination I found nose, naso-pharynx and pharynx apparently healthy. The vocal bands presented two small projections at the junction of the anterior and middle thirds, the projections being covered with small dots of tenacious mucus. On adduction these diseased portions were quickly brought in contact. Mezzo-voce singing was impossible in the upper voice, but the full voice was not much impaired. I was unable, in the three weeks of observation, to give her any relief. I did, however, succeed in persuading her to discontinue her operatic work, to rest three months and then begin rudimentary vocal exercises again under a good instructor. She fulfilled her promise, went to Paris and in the fall wrote me that her voice was in fine condition. She did heavy work all the following winter with unimpaired powers.

Papilloma of the larynx is not so distinctly an affection peculiar to public voice-users as the preceding disease, yet past observations would seem to show that these classes of patients are more subject to this form of growth than those in other walks of life. My own limited experience would surely indicate that laryngeal neoplasms are more likely to be found in the throats of those who use their voices in public. It must not be forgotten, however, that this class of patients are more quickly conscious of vocal defects and so come under observation with greater frequency. At any rate local laryngeal inflammation is recognized as an important element in the etiology of papillomata. Children are not exempt from the disease—two cases having come under my own observation. The nature of a papillomatous formation is that of epithelial proliferation and it has been called by one observer a benign epithelioma.[1]

[1] American Text-Book of Ear, Eye, Nose and Throat, page 1106.

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Case One.—Mr. A., public singer, consulted me on October 24th, 1896, for hoarseness. I found both vocal bands congested slightly. At the junction of the middle and anterior thirds was a small red tumor. The larynx was cocainized and the growth easily removed with a guillotine. The microscope revealed the growth to be a papilloma. No reaction followed the operation, the voice quickly improved and there has been no recurrence of the trouble. The after-treatment consisted of extreme care in the use of the voice and in prompt attention to laryngeal colds.

Case Two.—Mr. D., auctioneer, consulted me for hoarseness, September 5th, 1894. Examination showed a deviation of the septum sufficient to interfere with nasal respiration. There was considerable congestion of the pharynx, while both vocal bands were reddened. On the anterior portion of the right band was a growth of considerable size, attached by a small pedicle. The throat was extremely sensitive and it was impossible to do anything in an operative way until September 21st, when the larynx was cocainized and the growth removed. October 5th, the deflected nasal septum was straightened under ether. The restoration of normal nasal respiration did much toward controlling the pharyngeal and laryngeal congestion; but the forced use of the voice did not allow the complete cure of this inflammation. September 3rd, 1895, about a year later, the patient returned with the voice as husky as before. It was found on examining the larynx that the growth had recurred on the original site. September 12th, the papilloma was removed again. The patient decided to change his business. October 5th, 1896, he again presented himself for examination. This time the larynx was in a healthy condition and the voice has been normal ever since.

Case Three.—Mr. F., tenor singer, consulted me for hoarseness October 25th, 1893. The trouble had existed for some two years and he had been under treatment by different physicians during a greater portion of the time. I found the larynx to be inflamed considerably. On the anterior portion of both vocal bands were two pale growths. They did not have the appearance of papillomata which I had seen before and I felt in doubt as to the condition present. The throat was treated locally and the apparently indicated remedy given for some months without the slightest improvement being manifest. I then did not see the patient for some time. He consulted me again October 4th, 1894. On this visit he was completely aphonic and the two growths first noted had increased very materially. The larynx was cocainized and the tumors removed. They proved to be multiple papillomata, that is, the surface of the growths were surrounded with many rounded projections, each one apparently being an individual papilloma. In this case there were constant recurrences of the growths after removal. From October 4th, 1894, to April 12th, '99, twenty-five were removed at different times, and almost every portion of the vocal bands was at one time or another occupied by the neoplasms. Most of them were removed during the years of '95, '96 and '97. In '98 four very

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small growths were taken away and the last operation was made April 12th, '99. At present the speaking voice is fairly good (though singing is impossible). The general health is very good. The vocal bands present numerous flattened elevations and, of course, the larynx is far from healthy in appearance. The patient has been under close observation during this time. Local applications of thuya, of absolute alcohol—as suggested by Delivan[1]—also weak solutions of zinc chloride and silver nitrate were used from time to time without the slightest effect; but I feel confident that the *Mercurius biniodide* 3x did have a favorable influence, and that the improved condition of the larynx, in the past two years, has been due in a great measure to the drug. The remedy was not given originally for the condition of the larynx but for other symptoms referable to the pharnyx, which were only temporary. It was found, however, that the larynx improved while the remedy was being taken, and so it was administered from time to time in different potencies, the 3rd (three times a day) proving the most efficacious way in which to give it. These few cases of singer's node, selected from quite a number of a similar nature which have come under observation, during the past few years, would seem to support the conclusions of other observers, that singer's nodes, notwithstanding the denial of one writer,[2] do exist; and that they are caused by improper tone production. The treatment is obvious. The nose and naso-pharynx must be rendered as healthy as possible by treatment directed to these parts. Rest of voice is not sufficient for a permanent cure so long as a return is likely to the original faulty method of tone production. It is the physician's duty to call the patient's attention to this wrong method and to induce a change in the manner of voice production. It is not always easy to determine what is the right method of voice production. So-called methods are as numerous, almost, as the sands of the sea, but almost every throat specialist has on his list the names of teachers of singing, or of elocution, whom he knows to possess the requisite knowledge. Musical quacks there are as well as medical quacks, and the one should be avoided as assiduously as the other. Believing these nodes to be due to mechanical causes, I do not think that, so long as the cause exists, the internal remedies can influence them favorably other than to, perhaps, control, to a certain extent, any laryngeal inflammation which may be present.

The papillomatous formations must also receive similar attention as far as the use of the voice is concerned. Operative influence is also indicated. The case of a laryngeal tumor cured with *Conium* by Dr. Custis[3] and the apparent influence of *Mercurius biniodide* in my own case, are sufficient evidence of the efficacy of the homœopathic

[1] American Medico Surg. Bull., June 18, 1896, page 870.

[2] Musical Courier, '97.

[3] Case of laryngeal tumor, cured with conium. By J. B. Gregg Custis, M.D. Homœopathic Eye, Ear, Nose, and Throat Journal, June, 1896.

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remedy in this class of cases to make a trial worth while. Perhaps in time a sufficient number may be collected to enable us to form some definite conclusions regarding the influence of the homœopathic remedy on these affections.

DISCUSSION.

Dr. Fred. D. Lewis: Dr. Rice's paper covers the ground so completely that there is little left to add in the way of discussion. I would like, however, to draw attention to the fact that the general handling is on the lines of the most advanced teaching of to-day, *viz.*: the determination of the cause in any given case and the cure effected by the removal of the cause. The singers' nodes are undoubtedly due in many, if not in all cases, to faulty vocalization, and so long as this is persisted in no treatment, either local or constitutional, will render any permanent relief. An operation may be called for, but the physician's duty to his patient has not been performed by simply removing the result of an error, without instructing the sufferer in the only way of gaining the most relief, the avoidance of the cause.

I would have been pleased had the Doctor gone a little more fully into the medical considerations of the conditions presented, for it is not only in that direction that our school differs from all others, but frequently in my opinion, it is the means of attaining brilliant results. The case of frequently recurring papillomata that responded so beautifully to *Biniodide* of *Mercury* might have gone on recurring indefinitely, but that the constitutional discrasia that permitted their development was corrected by the indicated remedy.

I do not mean to imply, however, that the indicated remedy alone is sufficient, but it may play a most important part. A case I have in mind might do to illustrate. The man came under my care some years ago, referred to me by his family physician. The trouble he complained of was considerable throat irritation; examination with the laryngeal mirror showed a great deal of congestion of the pharyngeal and laryngeal mucous membranes. The patient was over-fat and the throat was in consequence narrowed. No growths of any nature were present, the nasal cavities were in fairly good condition, no deformities. Sprays, gargles, and the remedies apparently indicated by the appearance of the membranes were given, with temporary relief; the patient remaining away for a few months to return again with as bad a throat as ever for several more weeks of treatment. Convinced at last that there must be an underlying cause for the trouble, I made a careful study of my patient's general condition, had examination made of his urine, and found a uric-acid diathesis. Treatment along the lines of the modern treatment of rheumatism, regulation of diet, keeping the skin in good condition with frequent Turkish baths, advising him to buy a bicycle to ride to and from business instead of taking the cars, and I lost a patient, but made a friend. He has not required my services now for his throat for over a year.

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Another case that stands out clearly in my memory is that of one of our prominent public singers. She, for several seasons, when in my city, always had me treat her throat before each performance. Here was likewise only general congestion with some huskiness of voice. Her singing was always made easier by an application of a solution of aluminum aceto-tartrate. Her general health was good. For some time I had urged her to have instruction in the proper use of her voice, which I presume she did during her rest last summer, as in her engagement in Buffalo last winter I heard her and could see she was obtaining the same result as formerly with much less effort, and she did not need my attendance.

These are suggestions that I think Dr. Rice would do well to consider; his paper is excellent as far as it goes, but it does not, in my opinion, go far enough.

Dr. Hoyt: I had a case come into my office the day before I left, which I called a case of singer's nodules, although in a young woman who was not a professional singer but who tried to sing some in church and at home. She received a severe shock last January by running quickly for a physician in the night, without hat or shawl. Her throat pained her very severely for some days after that, with considerable of a spasmodic condition, and she had been hoarse ever since. She is an intelligent young woman, a college graduate. In examining the larynx, the only thing I could see wrong was a little nodule in the centre of the right chord, and a very tiny thickening in the centre of the left. That would correspond to what Dr. Curtis calls "Nodules of Attrition." I could not account for those nodules appearing, unless as a result of inhaling the very cold air which so irritated the larynx that this spasmodic condition followed and produced a sudden strain upon the vocal chords. Would Dr. Rice consider this a case of singer's nodules? When she is not using her voice any more than one does in ordinary conversation, what treatment would he advise?

Dr. Rice: It is very difficult to answer Dr. Hoyt's question. I don't think I could give him any suggestions.

Dr. Weaver: I was very glad to hear Dr. Rice mention *Thuja,* especially for growths in the larynx. I believe it is a remedy very well indicated for these conditions. I have seen five cases of recurrent papillitis in the larynx cured by the local application of *Thuja,* where operation after operation in three of the cases seemed to give but temporary relief. After removal they started immediately to recur. It took considerable persistency in applying the *Thuja* locally. First, I used the alcoholic preparation, but, later on, simply the aqueous *Thuja.* At the same time I gave it internally. I think it should be used in these cases, especially where you have them recurring so frequently, but it must be persisted in a considerable length of time to get the required results.

Dr. Rice: Let me say in answer to Dr. Weaver's argument in favor of *Thuya* that about a year ago, a gentleman consulted me, suffering

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from hoarseness. I found a large papilloma on one of the vocal bands apparently easy to remove, but I found it impossible to anæsthetize his throat; cocaine had no effect; eucaine was useless; neither of these drugs even quieted the reflexes. So after repeated attempts I gave up in despair.

I told him that if he was unable to control it by local applications or by internal remedies (and it grew so as to interfere with respiration) that I did not see any other way than external operation.

He was averse to an operation. For nearly a year he has been receiving applications of *Thuja,* beginning with the 10 per cent. aqueous solution and gradually raising it to a 50 per cent. solution. These applications have been used three times a week by his family physician who was taught to apply it properly.

For the first three months he apparently got some relief; the growth was smaller, more pale and I thought that we were to reach the desired end in a simple way. After this there was no change at all in the appearance of the growth and at the present time I cannot see that it is doing anything towards reducing the size of the tumor.

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REPORT OF MY LAST SERIES OF FIFTY CONSECUTIVE CATARACT EXTRACTIONS.

By A. B. Norton, M.D.,
New York.

THE present series of fifty consecutive extractions were made between February 12th, 1896, and January 31st, 1899. The report has been limited to a series of only fifty cases, because the large majority of my cataract operations are made at the New York Ophthalmic Hospital and unfortunately the system of records of operations kept previous to about this time makes any reliable data or results very uncertain. My general impression would be that my previous experience in cataract extractions, covering a period of fifteen years, would give practically as favorable results and I regret that the lack of positive data for these preceding years prevents the reporting of a much larger series.

Of these fifty cases, 32 were simple extractions, 14 extractions with preliminary iridectomy; in 2 cases an iridectomy had been made fourteen years before for iritis, and in 2 other cases a short time before the extraction, for glaucoma. The selection as to the method of operating, whether with or without an iridectomy, depended upon the individual case to be operated. The operation preferred in ripe uncomplicated cataracts, is the simple extraction without an iridectomy. In the thirty-two cases operated by this method, in this series, an iridectomy at the time of the operation was required in none. In previous simple extractions I have had two or three cases in which the iris would not remain in place and an iridectomy would have to be made at the time of the extraction. Prolapse of the iris occurred in six out of thirty-two cases. In three the prolapse was cut off and in others not. Five of these cases had a final vision of $^{20}/_{50}$ or better. The other was one of the three where the iris was cut off and the vision finally lost from opacity of the cornea. As this result was in a patient 82 years of age very unruly and mentally unsound the bad result should hardly be attributed to the method of operation.

The duration of treatment, *i. e.*, the time from the operation until discharged, averaged in the simple extraction nearly 21 days, while in the extraction with preliminary iridectomy it was a fraction over

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No	Sex	Age	Health	Eye	Cataract	Operation	Healing Process	Duration of Treat'nt	Discission	Ultimate Vision	Remarks
1	F.	46	Good	L.	Ripe	1896, Feb. 12, Preliminary iridectomy	Iritis	16 days	9 w'ks. after extr. Twice	20/70	
2	M.	80	Medium	R.	Ripe	Mar. 23, Simple	Anterior chamber long in closing(6days)normal	22 days	2 wk. 6 dys	20/20	
3	F.	60	Good	R.	Ripe	Apr. 27, Simple	Normal	18 days	3 wk. 3 dys	20/40	
4	M.	59	Fair	R.	Ripe, nephritic	May 7, Preliminary iridectomy	Normal	12 days	6 weeks	20/40	
5	F.	56	Good	R.	Ripe	Sept. 9, Simple	Normal	13 days	5 weeks.	20/30	
6	F.	66	Good	L.	Ripe	Sept. 17, Preliminary iridectomy	Normal	17 days	5 wk. 5 dys	20/20	
7	F.	70	Good	L.	Ripe	Oct. 14, Simple	Prolapse of iris 3d. day. Iritis, slow healing	41 days		20/50	Pupil clear but drawn upward by adhesion of iris to cornea
8	F.	60	Good	L.	Ripe	Oct. 28, Simple	Slight iritis, normal	20 days	6 weeks	20/70	
9	F.	69	Good	L.	Ripe	Nov. 9, Simple	Prolapse of iris on 2d day from coughing ; cut off. Normal	23 days	4 months	20/50	Opacity of cornea at wound
10	M.	48	Good	L.	Ripe	Nov. 16, Preliminary iridectomy 3 weeks before	Normal	14 days	6 weeks	20/20	
11	M.	75	Good	R.	Ripe	Nov. 17, Simple	Anterior synechia. Nor.	16 days	8 weeks	20/50	
12	M.	58	Good	R.	Ripe	Nov. 23, Simple	Normal	12 days	5 weeks	20/50	
13	M.	47	Good	L.	Ripe	Dec. 7, Simple	Normal No reaction	10 days	5 weeks	20/30	
14	M.	66	Good	L.	Ripe	Dec. 19, Simple	Severe vomiting and retching commenced 6 hrs. after operation and lasted 24 hours with no injury to eye. Normal	9 days	5 wk. 3 dys	20/40	
15	M.	59	Joints Swollen and anchylosed from rheumat'm	L.	Ripe, posterior synechia	1897, Jan. 16, Iridectomy made on both eyes 14 years before for rheumatic iritis. Pupil very small from subsequent attacks. Extraction of lens difficult	Slight iritis	25 days	1 months	20/200	Exudation from recurrent attacks of iritis blocked up pupil so that 1 yr. later vision was nil. Iridectomy was then made with De Wecker's scissors giving a clear pupil and vision again raised to 20/200. Opacities in vitreous

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No.	Sex	Age	Health	Eye	Cataract	Operation	Healing Process	Duration of Treat'nt	Discission	Ultimate Vision	Remarks
16	M.	45	Good	R.	Traumatic; from injury, cutting the cornea, iris, and lens	Jan. 26, Iridectomy was made for the rapid swelling of the lens, causing an increased tension. Extraction downward and inward, the only clear and uninjured portion of cornea	Normal	14 days	4 weeks	20/40	Left eye had been lost by similar accident some years before. From appearance of injury, at first did not expect to save the eye, much less useful vision
17	M.	51	Heart Disease	L.	Cataracta nigra	Feb. 1, Simple	Owing to cocaine poisoning had to postpone extraction after opening eyeball. Two days later extracted very large black cataract under ether. Panophthalmitis ensued due to reopening of the wound, and the abnormally large lens	26 days		Nil	Just on completing incision heart's action ceased and patient became rigid. After stimulants seemed to revive. Started again. Another spasm came on that lasted 2 hr. Was several days before he became natural again. Told me that once before when cocaine had been used for extracting teeth he was made unconscious for several days.
18	M.	49	Good	R.	Ripe	Feb. 3, Simple	Normal	16 days	4 weeks	20/30	Same patient as No. 35. Has had several attacks of glaucoma, prompt treatment with eserine and sclerotomy relieved each time with no loss of vision
19	F.	55	Good	L.	Ripe	Mar. 8, Simple	Normal	14 days	8 months	20/50	Pupil and fundus clear.
20	F.	61	Good	R.	Ripe, complicated with glaucoma	Apr. 6, Iridectomy for glaucoma three weeks before	Normal	21 days	2 months	20/40	This vision was subsequently lost by recurring attacks of glaucoma. Individual attacks were relieved by eserine and sclerotomy

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No.	Sex	Age	Health	Eye	Cataract	Operation	Healing Process	Duration of Treat'nt	Discission	Ultimate Vision	Remarks
21	F.	82	Unsound Mentally	R.	Ripe	Apr. 20, Simple	Patient very unruly. Would not keep quiet or let eye alone. Large prolapse on fifth day, cut off. Opacity of cornea	2 mos		Light Perception	Cornea flattened and opaque
22	M.	73	Feeble	R.	Ripe	May 3, Simple	Normal	19 days	3 weeks	20/40	
23	M.	64	Good	R.	Not matured complicated with acute glaucoma	May 3, Iridectomy three months before for acute glaucoma	Normal	12 days	2 weeks	20/100	
24	F.	63	Good	R.	Ripe	May 10, Preliminary iridectomy	Normal	19 days	2 weeks	20/40	Pupil clear. Vitreous still cloudy.
25	F.	73	Good	L.	Not mature. Complicated with macula cornea	May 24, Preliminary iridectomy downward and inward	Normal	14 days		20/200	Right eye lost from glaucoma a few years before. Macula all over cornea.
26	F.	65	Poor	R.	Ripe	Oct. 12, Simple	Considerable iritis	26 days	3 months	20/50	Several posterior synechia. Pupil oval. Posterior staphyloma.
27	M.	59	Good	R.	Posterior synechia	Oct. 20, Iridectomy 14 yr before for rheu. iritis	Slight iritis	25 days	6 weeks	20/200	Same case as No. 30
28	F.	47	Fair	R.	Ripe	Oct. 26, Simple	Normal	19 days	4 weeks	20/40	
29	F.	64	Good	R.	Ripe	Nov. 29, Preliminary iridectomy	Large amo't. of cortical substance left. Iritis	30 days	2 months (Twice)	20/30	
30	M.	58	Good	R.	Ripe	Dec. 2, Simple. Lens extracted in capsule caused by patient squeezing the eye before it was lacerated. Some vitreous lost	No iritis	21 days		20/40	Operated left eye some years ago with a vision of 20/30
31	M.	56	Good	L.	Ripe	Dec. 6, Simple	Prolapse of iris. Normal	24 days	6 weeks	20/20	
32	F.	60	Fair	L.	Ripe	1898, Jan. 3, Simple	Normal	23 days		20/70	
33	F.	59	Good	L.	Ripe	Jan. 31, Preliminary iridectomy	Normal	15 days	3 weeks	20/20	
34	F.	70	Good	R.	Ripe	Mar. 9, Simple	Slow healing	27 days	2 months	20/20	
35	F.	71	Good	R.	Ripe. Total posterior synechia	Apr. 20, Preliminary iridectomy	Slow healing on account of iritis	35 days	Inside of 2 months	20/40	

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No.	Sex	Age	Health	Eye	Cataract	Operation	Healing Process	Duration of Treat'nt	Discission	Ultimate Vision	Remarks
36	F.	53	Feeble	L.	Not matured	May 11, Preliminary iridectomy	Normal	12 days	4 weeks	20/40	Slight atrophy of the optic nerve.
37	M.	25	Good	L.	Soft, immature	May 29, Simple	Normal	14 days		20/50	Vitreous slightly hazy.
38	M.	72	Good	L.	Ripe, dacryocystitis chronica	June 2. Simple	Normal	12 days	8 weeks	20/20	
39	F.	61	Good	R.	Not mature	June 4, Preliminary iridectomy	Normal	15 days	3 months	20/30	
40	M.	64	Good	R.	Ripe	Oct. 4, Simple	Normal	14 days	3 months	20/20	
41	F.	53	Feeble	R.	Not matured	Oct. 8, Simple	Normal	16 days	6 weeks	20/20	
42	F.	62	Good	R.	Not matured	Oct. 13, Preliminary iridectomy 1 month ago. Lens extracted in capsule.	Normal	15 days		20/100	
43	M.	75	Fair	L.	Ripe	Nov. 1, Preliminary iridectomy 12 days before	Normal	14 days	10 weeks	20/20	Preliminary iridectomy was made because the other eye was lost with chronic glaucoma.
44	F.	50	Good	L.	Ripe, complicated macula cornea, nystagmus and strabismus divergens	Nov. 10, Simple	Normal	12 days	6 wk. 4 dy.	20/70	Simple extraction was made because maculæ were less dense over pupil
45	M.	48	Hard Drinker	L.	Ripe	Dec. 13, Simple. Lens expelled by patient squeezing the lid after laceration of the capsule	Slight prolapse of iris on 7th day. Patient unruly	30 days	5 weeks	20/30	Prolapse of iris has disappeared leaving a cystoid wound

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No.	Sex	Age	Health	Eye	Cataract	Operation	Healing Process	Duration of Treat'nt	Discission	Ulrimate Vision	Remarks
46	F.	71	Good	L.	Ripe	Dec. 13, Simple	Very uneasy and restless night of operation, had to give hypodermic of morphia to keep her quiet. Slow restoration of anterior chamber (5 days). Twelfth day was struck in operated eye by another patient resulting in hæmorrhage into anterior chamber and iritis	28 days	7 weeks	20/30	Slight adhesion to corneal wound
47	F.	33	Very stout	R.	Ripe	1899, Jan. 10, Simple	Large prolapse of the iris on the following day, was cut off and replaced. 3d day cornea hazy, chemosis, and wound gaping from cortical substance. Slow recovery	34 days		20/40	Opacity of cornea extending slightly below corneal wound. Pupil distorted upward
48	M.	48	Hard drk'r	R.	Not matured	Jan. 18, Simple	Normal	20 days	6 wk. 3 dy.	20/30	
49	M.	51	Good	L.	Ripe	Jan. 24, Simple	Normal	18 days	5 weeks	20/30	
50	M.	32	Good	L.	Soft	Jan. 31, Simple	Normal	13 days	4 wk. 4 dy.	20/20	

VISUAL RESULTS.

Ultimate Vision 20/20 in 11 cases.
" 20/30 " 9 "
" 20/40 " 12 "
" 20/50 " 7 "

Ultimate Vision 20/70 in 4 cases.
" 20/100 " 2 "
" 20/200 " 3 "
" Nil " 2 "

If we now arrange the ultimate visual results according to the classification followed by Knapp of calling all results of 20/200 or better as perfect we have

Perfect, 48 cases, or 96 per cent., ranging from vision 20/20 to 20/200
Failures, 2 " 4 " vision Nil.

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18 days, a difference in the length of time of three days in favor of a preliminary iridectomy, but as the iridectomy itself usually requires three or more days there was no gain. The average duration of treatment in the simple extractions was greatly increased by the cases of prolapsed iris as in cases 7, 21, 45, 46 and 47. With these omitted the average is a little less than that where an iridectomy had been made.

A comparison of the results as to ultimate vision gives us no reliable data. The difference in the cases, the complications, the total loss of vision in two cases of simple extraction, *viz.*, 17 and 21 which in either case could not be chargeable to the *method* of operation, and 4 other cases where no discission was made, prevents any comparative figures. The results in all cases of ultimate vision of $^{20}/_{50}$ or better give about the same percentage to the total number of cases operated by either method.

The good vision obtained in these cases I attribute to my almost universal rule to make a discission on every case, and to repeat the needling as many times as it is necessary to get a perfectly clear pupil. In fact I do not consider my cataract operation as finished until after a successful discission. In my experience it is much better to wait six weeks or more, where it can be done, before needling as the capsule becomes more tense the longer it is left after the extraction and gaps open and rolls out of the way better after it is divided. As a rule, however, these patients are too eager to again use their eyes to wait for a sufficient period to elapse before needling. This is, of course, especially apt to be the case in a large hospital practice, for as a rule their living depends upon the use of their eyes.

The relative gain in vision from the discission operation after cataract extraction has been shown by Knapp in his "Report on a third series of one hundred successive cataract extractions without iridectomy" to be as follows. "The average visual result of extraction is $^{20}/_{70}$, which by subsequent cystotomy is converted into $^{20}/_{30}$." While our records are not sufficiently full to give positive data in this respect still I am strongly of the opinion that the value of a cystotomy is not overestimated by Dr. Knapp.

Another factor contributing to the particularly favorable ultimate results I believe to be the extreme care taken in the final adjusting of glasses. Fully eight-tenths of my cataract cases are given cylindrical lenses. The amount and axis of the astigmatism being very carefully determined both with the ophthalmometer and the trial lenses. This point is referred to because in a recent report of sixty cases a cylindrical

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lens is recorded as being used in but three cases. Another author reports a series of twenty-five cases with astigmatism in five. As it has long since been shown by measurements that the shape of the cornea is altered to quite a degree by the section of a cataract extraction, the vertical meridian becoming flatter, it would seem to the writer that many operators do not pay sufficient attention to the correction of the corneal astigmatism which is always present in a higher or lower degree. Pfingst in the *Archives of Ophthalmology,* Vol. 25, reports the measurements of the cornea after cataract extraction in 59 cases operated upon by Dr. Knapp with an average astigmatism two weeks after the extraction of 7.7D.

Very few reports of cataract operations record the refraction and the glasses ordered, but I am convinced that much better results could be obtained by careful attention to the correction of the resulting astigmatism. It is at all events an important subject which we hope to pay more attention to in another article.

Method of Operating.—It is my rule to always have the patient admitted to the Hospital twenty-four hours before the operation. The patient is then given a bath and the head and face thoroughly washed with soap and water. Just previous to the operation the face is thoroughly scrubbed with corrosive sublimate 1 to 4000, great pains being taken with the eyebrows and eyelashes. The eye is then flushed with a bichloride solution 1 to 8000 and instillations of a 4 per-cent solution of cocaine used. In operating I use a knife made for me by Tiemann and Co., the blade of which is broader and shorter than the usual Graefe knife. The speculum and fixation forceps are always used until after the division of the capsule, then both are discontinued and while the assistant draws down the lower lid, a firm hold of the upper lid at the ciliary border is taken with the index finger of the left hand. A hard rubber spoon is then applied to the lower border of the cornea and pressure made downward and backward to tip the lens on its axis and as it presents at the wound is gradually followed up with the spoon, the pressure growing less as the lens advances. All the cortical substance that can be easily coaxed out is removed but in simple extraction it is not my practice to manipulate too long or too strongly to remove it. Where an iridectomy has been made you can remove the cortical substance much easier and safer than in the simple extraction.

As to the section in simple extraction, it has always been made wholly in the cornea. I have varied it at times from just at the corneal

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margin to about midway from the corneal margin to the upper edge of the pupil. The great drawback to the simple extraction is the liability to prolapse of the iris and I am sure that the danger of the prolapse increases as the section approaches the corneal margin. The objection to a more central section seems to me to be a higher degree of corneal astigmatism and oftentimes a slower union of the wound and a more tardy restoration of the anterior chamber. As these latter factors are of much less gravity than a prolapse of the iris it seems to me as though a less peripheric section is to be preferred.

In the extraction with the iridectomy on the other hand I continue to make the old Graefe linear section, the puncture, counterpuncture and the section all being in the corneo-scleral margin.

The opening of the capsule or cystotomy is made with the cystitome introduced under the upper part of the iris and scratching the capsule at its periphery.

Before the dressing is applied care must be taken in the simple extraction to see that the iris is not only back in place but that the pupil is perfectly circular. If it does not readily go back of its own accord it can be gently stroked into place with a spatula. The eye is then flushed with a boracic-acid solution and a piece of sterilized gauze wet in a 1 to 4000 solution of the bichloride is applied over the closed eye. Upon this is placed a small piece of absorbent cotton soaked in the same solution which molds itself to the eyeball making gentle and uniform pressure to all parts. Over this a second and sometimes a third pad, but dry, is placed and the whole held in place by two strips of adhesive plaster. This dressing I have adopted as very much lighter and more comfortable than the old roller bandage, and as better than the gold-beaters' skin applied to the lids because easily removed without disturbing the wound as the latter dressing when stuck to the lids is apt to do. The patient is then carried to the bed and instructed to keep on the back or the unoperated side for the first forty-eight hours. It has been my practice of late to examine the eye the day after the operation in order to cut off any prolapse that may have occurred, but as I have so frequently found no prolapse on the first examination and then to have it occur on some subsequent day that I shall try the method advocated by Galezowski of not opening the eye until a week elapses. He claims that by this method he scarcely ever finds a prolapse of the iris.

This paper has been presented with the hope that it will result in a

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free discussion by the members present for the subject is one of interest to all of us.

DISCUSSION.

Dr. Moffat: I would like to ask Dr. Norton how he makes his capsulotomy, and the comparative results of the different methods.

I prefer the old way of describing the corneal cataract incision, *i. e.*, the distance of its apex from the apex or limbus of the cornea; the edge of the pupil is too variable.

Formalin is perfectly satisfactory as my antiseptic. I have had two eyes broken open after operation by a blow, so now protect the eye with a cage or, better, Ring's mask held in place with adhesive strips beside a bandage; under this I have only a strip of gold-beater's skin-plaster from the upper lid to the cheek, leaving room for the escape of tears.

Dr. Norton spoke of astigmatism. In the *Annales d'Oculistique*, Dec., 1895, Dr. Georges Martin, of Paris, called attention to Wherrell's error when coining this word. The Greek στιγμα—ατις means a point in the sense of a prick or sign, but a mathematical point is translated by στιγμη—ης. Therefore we should say *astigmia* for astigmatism, and *astigmic* instead of astigmatic. I plead with the members of this Society to exert their influence for this reform in the name of scholarship and accuracy; especially let each secretary and each editor make this correction as he would any other *lapsus linguæ*.

Dr. Payne: It seems to me that the question of opening the capsule is a very important one, and, of the different methods that I have tried, my experience has been that a "T"-shaped section has been less productive of trouble and leaves less liability to a necessity for a needle operation later. The opening of the capsule is accomplished simply by passing the instrument down to the lower extremity of the capsule, drawing it up over the middle of the capsule, and then following the superior border with a cross-section. In that way two large cuts are made which, on extraction of the lens, are apt to divide and leave an opening that demands less attention later in the way of an operation. At times, in using the cross-section, I found the flaps fell together, and that they interfered very greatly with vision afterwards. Since the adoption of this method, I have had very much less trouble. In the method of treatment of the eye after the extraction as to dressing, I find it very much better to use isinglass plaster instead of gold-beater's skin. I have preferred to use that as I found that the lachrymation sometimes followed and was very apt to wash off the gold-beater's skin and hence I have adopted the silk isinglass, getting the very thinnest possible, that put up by Johnson, & Johnson. I make two strips for each eye which start from above the superior border of the eyebrow, running down the cheek and crossing each other opposite the eye. I have had no trouble after having used this method for several years, and imagine that by its use I have had

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less astigmia to correct later. These have been the expedients which I have adopted for the last few years with most satisfactory results.

Dr. Suffa: I would like information in regard to stitching the cornea after cataract extraction, whether any members have had experience in that line, and if so the results. Vol. XXVII., No. 2, 1898, *Archives of Ophthalmology,* contains an excellent article on a series of experiments on stitching corneal incision on the rabbit after removal of the lens. The author, Dr. W. H. Bates of New York, gave good reasons why stitching of the cornea should be employed after cataract extraction in the human being, and the method of application. I have one case to report, where a stitch was necessary and gave quick and good results. It was after a simple extraction, in a traumatic case, where the anterior and posterior capsule had been ruptured. As soon as the corneal incision had been made, before the forceps and knife could be laid aside, the patient had a spasm of the lids, forcing out the lens, and apparently one-fourth of the vitreous. The speculum was quickly removed, the eye closed, and dressings adjusted. No undue reaction ensued, but a bead of vitreous persisted in separating the edges of the wound, and as the patient was very unruly during dressing, having no control over his lids, I decided to bring the edges of the wound together with a stitch. This was done under anæsthesia eight days after the extraction. One central stitch was sufficient to close the gaping wound, and replace the bead of vitreous. Union was uneventful and rapid, and there was no further trouble in doing the dressings.

Dr. Thomas: Since the early years of my practice I have done cataract extraction almost exclusively with a preliminary iridectomy, and, with few exceptions, have not felt that in the interest of my patients, or of my own comfort, I had the right to depart from this method. It seems to me if we look into the matter very carefully that there can be little doubt as to the greater safety in the extraction of cataract with preliminary iridectomy. Indeed, I think I can recall reading a similar statement over the signature of Dr. Norton himself. I believe we are all agreed that when a case is a complicated one, and perhaps where there is but one eye, the extraction should be done in this way: no chances, no risks are here to be taken. This statement is repeated over and over in our writings, and yet if the preparatory iridectomy is advisable under such conditions, why not in all cases? Our great desire I take it is to remove the cataract in the simplest possible way and with the greatest safety to the patient.

Supposing iridectomy to have been done, (and I doubt if there are many of us who will claim that this little operation is productive of danger, or adds to the complication, if done as a preparatory one,) I can conceive of nothing more simple than the removal of the cataractous lens. We have simply to incise the cornea, open the capsule and press out the lens; and as to the healing process nothing can be more simple or sure. I may say briefly that I give next to no thought to my cases after extraction—they cause me no anxiety.

I am never called upon hours or days after the extraction to

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examine for or replace a prolapse, or do an iridectomy under very unfavorable conditions, perhaps under a general anæsthetic. The healing goes on uninterruptedly, provided the extraction has been done according to the rules of the art.

On the third or fourth day the unoperated eye is uncovered, and four or five days later all dressings may be removed.

The case is discharged about the twelfth day. As to the capsulotomy, the invariable practice in my clinic is the T-shaped incision. We at one time did the peripheric capsulotomy of Knapp, but have of late years added to it the vertical cut. The dressing is very much the old one of Graefe—*i. e.*, the binocular roller, excepting that we use a wet compress in place of the dry one, dipping it into the soda water for boiling the instruments.

This is left on without change for three or four days, when a drop of a 6 to 8-grain atropine solution is instilled and repeated with each daily dressing thereafter. I notice that Dr. Norton speaks of occasional difficulty in removing the cortex. With a preparatory iridectomy this most important part of the operation is certainly much more easily accomplished than where the simple extraction is done. Is it not most desirable that we secure as much as possible of the cortex at the time of the operation in view of the subsequent difficulties in the needling?

It seems to me the preparatory iridectomy affords us a decided advantage in this particular. I want to thank Dr. Norton for his most practical and valuable paper.

Dr. Deady: There is one point in this matter, I think, which has a bearing on the method of dressing. It has been my experience for a good many years, both in my own cases and those of others, to notice that where the skin covering was used instead of the pad that, other things being equal, there was less redness and the time of the redness was shortened. In reference to that matter, I have another thing to speak of, and that is, that in a recent case where the patient very strongly objected to having the second eye covered, I allowed it to remain uncovered, and had one of the quickest results I ever saw. It is the first time, I think, I ever operated a cataract without covering both eyes, but there was not the slightest difficulty from one end to the other in the case. I do not know whether the gentlemen present are in the habit of doing this sort of thing, but I thought I would mention it for what it was worth.

Dr. Beebe: Will Dr. Norton give us the average length of time which his patients were in the hospital after the extraction? I came to the conclusion several years since, that the use of the bandage, however applied, was a damage and an injury after cataract extraction and that the simple court-plaster was the best after-dressing as it is, in fact, in almost any disease of the eye. I am aware that the dressing which Dr. Norton suggests is the one which Professor Knapp now uses and that he has greatly modified his former methods of dressing, but I am convinced that had Dr. Knapp resorted to the use of the plas-

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ter dressing years ago, his average results would have been much better than they are now.

Dr. Stephenson: I would like to ask if any have used the rubber dam in place of either isinglass or roller for a bandage. That is to say after the dressing following the operation, place a moist pad and then a dry one over the eye, fill out the opposite side with dry cotton, then place your strip of rubber two inches wide and five long with a tape in each end to tie with. I learned of this dressing from a Doctor in Salt Lake City, and since that time I have used it, and find that four days after, on removing the first dressing, the cotton is moist, that it comes away easily from the lids, and has not become stiffened as other dressings do. I have found it very successful in my work.

Dr. Norton: I am glad to have stirred up some discussion. In regard to the matter of capsulotomy, Dr. Knapp, of course, is the man in this country who makes the greatest number of cataract extractions. I have simply followed his lead in making a peripheral incision. As to the method, it is to me easier to just sweep the cystotome around the periphery that it is to go down to the bottom and draw up and then across from side to side; and the simplest methods are the best. In the secondary operation he first split the capsule in the shape of T, later changed to a + incision, which he says is the ideal operation giving a clearer pupil than any other. The occurrence of glaucoma in 1 per cent. of his cases of discission led him to return to the T incision. I have had glaucoma in one case which was relieved at different attacks by eserine and sclerotomy. As to the use of holocaine, referred to by Dr. Moffat, I do not use it at all in extractions; because holocaine does not give any dilatation of the pupil, or very little, and I use no mydriatic in simple extractions. I get all the dilatation I care to from the cocaine, using that in preference to holocaine for this reason and because it is less irritating. As to the method of dressing which has been referred to by several. The ideal dressing is that which keeps the lid in perfect apposition and is as light as possible. My objection to the gold-beater's skin or any dressing applied directly to the eyelid is that in drawing off the gold-beater's skin, you have to make more or less manipulation upon the eye before the wound is perfectly healed; and I think a great many have found that they have had opening of the wound from removal of the dressing when applied directly to the eyelid. The use of cotton as I use it is very light and soft: it is not hard and rolling as has been suggested. I do not believe in applying the rubber dam suggested by Dr. Stephenson: I think we would get too much heat by the use of the rubber as a cap—it would act too much in the nature of a poultice as suggested by Dr. Moffat. I simply use a thin layer of bichloride gauze and a little thin pad of cotton, a pad about two inches round, and not more than one-half inch in thickness, lightly soaked in water, laid in its wet condition directly over the eyeball. It molds itself to the shape of the eye, is light in weight, and then I apply over it a light piece of cotton to fill out the shape a little more. That dressing

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has, in my experience, proved very light, soft, comfortable to the patient, and very easily removed without any disturbance to the eye-ball.

In answer to Dr. Beebe I would say that I expect to discharge my patient from the Hospital on the 14th day, and as a rule do so (or before) in the large percentage of cases of perfectly smooth healing, with no complications. The protracted cases, however, as pointed out in this paper have made the total average 21 days in the simple extraction and 18 days when made with the preliminary iridectomy.

As to Dr. Thomas' suggestion that I have previously stated that preparatory iridectomy is safer, I think I must acknowledge the correction. If I had but one eye I should prefer to have it operated with preliminary iridectomy. Dr. Thomas' argument that if the extraction with an iridectomy is the safest operation it should be used at all times is unanswerable. It would perhaps be best to confine the simple extraction to those rare cases that decline to submit to two operations, the preliminary iridectomy and the extraction to follow. I have only made the simple extraction in uncomplicated cases. When we have a patient with but one eye, or any complication such as adhesions from iritis or other trouble, I always use the old method of preliminary iridectomy, believing that, perhaps, it is the safer; but a great many patients object to two operations—the iridectomy followed by the extraction later on; and where we get a perfectly matured case of simple cataract, I find no more difficulty in removing it by the simple method than by preliminary iridectomy.

Dr. Thomas has also referred to the removal of the cortex. I stated in my paper that it can be removed much easier and more thoroughly in the operation with an iridectomy, but as most of this cortical substance will become absorbed I do not believe we should take any chances of accident by too much manipulation for its removal.

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AN UNUSUAL TUMOR OF THE EYE AND MALFORMATION OF THE ORBITAL STRUCTURE, WITH ABNORMAL DEVELOPMENT OF THE CRANIUM.—OPERATION.

By George A. Suffa, M.D.,
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Case.—Agnes Graham. First seen January 9th, 1896, when five weeks old. Presented the following condition which was present at birth. A fleshy-appearing tumor, approximately one and one-quarter inches long horizontally, three-quarters of an inch wide vertically and one quarter of an inch thick occupied the right palpebral opening. Under general anæsthesia this growth was found to be firmly attached to the sclera from above the cornea, which was displaced downward beneath the lower lid to the integument above with which it was continuous. The cornea could only be seen by retracting the lower lid, was opaque throughout, and the lower border was continuous with the inferior cul-de-sac, the eye being firmly fixed in this position. The lower lid was normal in all respects, but the upper lid was apparently cleft and the division filled with integument with which the growth was continuous; the lid and lashes were displaced outward, external to the tumor, and a shallow superior cul-de-sac existed at this point. The lashes were turned upward close to the skin and a wart occupied the external canthus. The growth dipped toward the equator beneath the ocular conjunctiva, at the outer canthus; and the conjunctiva at this point did not seem healthy. and was reflected directly to the canthus. The frontal bone was, perhaps, slightly flattened on the right side, as well as the frontal sinus, and a depression, almost an opening through the skin, was present just below the normal position of the supraorbital notch or forearm, beneath which depression a freely movable spicula of bone could be felt. A similar condition, to a less degree, exists on the left side, although the eye-ball is placed normally, and is capable of movement, somewhat limited in certain directions. The upper lid margin is divided by a wart, the under surface of which is continuous with the ocular conjunctiva, practically obliterating the cul-de-sac at this point, and to a considerable extent outward. There is not only obliteration of the cul-de-sac at this point, but also an abnormal amount of tissue extending to the cornea, which is opaque in its outer half, vision being possible only through the inner half. The whole cranium shows marked irregularities and lack of development. The forehead or frontal bone protrudes on the left side, bulging in the right temporal region; antero-posterior diameter is enlarged; and vertex pointed longitudinally; in fact, the whole cranium is enlarged, suggesting hydrocephalus. The fontanelles were large, especially the posterior; they were connected by a separation of the parietal bones,

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a non-union of the sagittal suture. At the posterior fontanelle the brain protruded, causing a very perceptible bulging, and the scalp appeared thin, almost ready to break through a space fully half an inch in diameter; throughout this area, and considerably beyond on the right side there is an entire absence of hair. At the present time the area has become somewhat smaller, but there is still a bald, glossy area entirely devoid of hair follicles and subcutaneous fat. The condition can more readily be understood than is possible to convey by pen, by examining photographs of the child when about one year of age; although at that time the saggital suture had closed, the fontanelles were much diminished in size and the bulging at the posterior fontanelle was less marked. In addition to all these irregularities, of which there were already a sufficiency to satisfy the most avaricious, a tumor developed on the right lower gum, which absorbed the bony wall between the two alveoli, extending fully half an inch into the inferior maxillary bone. The growth was very soft; macroscopically it had every appearance of being malignant, and microscopically was pronounced a round-celled sarcoma, and a serious prognosis given. About six months later another tumor appeared on the upper jaw which had the same general characteristics, though somewhat firmer in consistence. Both tumors were thoroughly removed and the cavities curetted and cauterized with the actual cautery by Dr. Hayward. Neither recurred and up to the present time there is no evidence of further trouble.

On January 30th, 1899, the ocular tumor was removed, the sclera incised vertically, the cornea and contents of the sclera removed and a Mule's glass sphere inserted. On removing the tumor it was found firmly adherent to the sclera, though not continuous with it; in no part of the growth was there any evidence of the levator palpebrarum or superior or external recti muscles, although the mass covered the region normally occupied by these muscles. Removal was begun at the superior inner portion, and the incision continued along the integument, where twelve spurting arteries were cut across. The outer free portion of the growth was covered with what appeared like conjunctiva. It was thought best to save this conjunctival tissue for future use, as the tumor at this point graded into normal orbital tissue. Removal of the growth was continued to the equator until normal orbital tissue was encountered, to be sure that all abnormal tissue had been removed, and to form a cul-de-sac, as at this point the orbital tissue was excessive. The lacrymal gland was encountered at the outer edge of the growth, being abnormally placed under the ocular conjunctiva, superiorly. The tumor collapsed fully one-half as soon as removed, the reason for which is readily seen by its richness in blood-vessels. The cornea, as previously stated, was opaque but normal in size, perhaps slightly thickened. The iris, lens, vitreous, retina and choroid appeared normal. The retina converged to form the optic nerve, which was placed in the sclera below and anteriorly, near the equator, on account of the extreme downward rotation of the eyeball. The nerve itself was placed in its normal orbital position. At this point the reason was found for

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PLATE 1

Side view before operation.

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Front view before operation.

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the fixed position of the eyeball, the apex of the orbit being filled with bone and cupped anteriorly to receive the posterior third of the eye, to which it was firmly adherent. At the termination of the cup, superiorly, the bone shelved upward, which shelf received the attachment of the triangular piece of bone previously mentioned.

Diagram No. 1 shows in profile a vertical incision through the tumor, centers of the eye, the spicula of bone, and the bony apex, and explains itself.

After bleeding had ceased, which was no more than is usual during evisceration, a small glass sphere was inserted and the sclera closed with silk sutures. An incision was made vertically through the integument to the point of the spicula of bone, a small triangular piece of the integument removed outwardly, the piece of bone removed and the operation completed by closing the gap in the skin and stitching the conjunctiva, saved at the outer angle, into place. With the exception of the cutting out of the lower suture in the lid healing was rapid and without undue reaction, soft granulation soon covering the denuded area.

On February 12th the granulations over the site of the tumor were removed, and when bleeding, which was profuse, had ceased, the area was covered with the ocular and palpebral half of a jack rabbit's conjunctiva and fastened in place by a continuous suture. For the benefit of those who have not grafted large pieces of conjunctiva I will describe, somewhat in detail, the steps of the procedure. No difficulty was encountered in separating the ocular portion of the rabbit's conjunctiva, but not so with the palpebral and third lid region, so that when these portions were reached no effort was made to remove only the conjunctiva, but connective tissue and conjunctiva were removed together. To remove this connective tissue and the third lid proved a difficult task, as the conjunctiva persisted in rolling up into a string and could only be kept from doing so by turning it over the index finger. When the task had finally been accomplished it was difficult to tell which was the outer surface, and, had not a stitch been placed both in the ocular and lid portions, it would have been even more difficult. The next problem was how to hold it in place for suturing. This was accomplished by again stretching it over the left index finger and holding it as near as possible to its final resting place, inserting two loops of the continuous suture into the conjunctiva of the lower lid and graft before drawing it into place, then spreading the graft over the denuded area, where it remained by its own adhesiveness until fastened into place.

Dressings were first oiled silk, covered with sterilized gauze pads, held in place by adhesive strips, and the mother and nurse were instructed to exercise care that the dressings should not be disturbed. The child passed a restless night, and I found on my visit that the dressings had been displaced, so that it was deemed wise to examine the graft and adjust a new dressing. This was done under anæsthesia, and the following interesting condition was found. Four pink points

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one-eighth of an inch in diameter and fully one-quarter of an inch apart were symmetrically placed around a centre, the upper two, circular, were pink throughout; the two lower, somewhat larger, were striped vertically; the rest of the conjunctiva appeared just as it did after removal from the rabbit. This certainly was very encouraging, and shows that union begins very quickly, within twenty-four hours.

In order to avoid displacement of the graft, should the child again rub the eye, a suture was placed in the outer third of the lids and the dressing replaced. The dressing was not disturbed for two days, and then only the integument around the eye washed with a boracic solution. Five days after the operation, the stitch in the lid was removed and the graft carefully inspected. The pink spots had increased in size, and the whole graft was glossy except a small part in the centre, which was white but seemed firm, showing no tendency to slough; even the edges of the graft were adherent. As considerable secretion was present under the oil silk it was discontinued. The future dressings were gauze and absorbent cotton held in place with adhesive strips.

A third operation, on February 23d, was for the purpose of forming an artificial upper lid and superior cul-de-sac. In order to accomplish this end, an incision was made through the skin horizontally, outward, from the outer angle for an inch and a half. An incision was carried through the conjunctiva in the small portion of the superior cul-de-sac, and continued into the inferior cul-de-sac fully one-quarter inch and the integument undermined from the temporal end of the incision to the bridge of the nose, fully one inch above the brow. The lower lid margin was split for one-quarter of an inch to connect with the incision in the inferior cul-de-sac. This splitting of the lower lid was for the purpose of furnishing conjunctival lining for the portion of skin to be slipped over from the temple to form the outer half of the upper lid, and also a denuded area for the purpose of narrowing the palpebral fissure. A triangular skin graft, except a pedicle at the inner part, was removed above; the incision beginning at lid margin, just inside of cilia, extending upward and inward for fully one-half an inch, then downward and inward to pedicle, and continued below the pedicle to lid margin near the inner canthus. This skin graft was then moved slightly outward and fastened with sutures above the conjunctival graft to form the ocular portion of the superior cul-de-sac in this region. The opening in the lid was brought together with three sutures, one below the pedicle near the edge of the lid, and two above the pedicle. The conjunctiva, separated from lower lid, was reflected and stitched to the outer portion of the upper lid. Four sutures were inserted to close the temporal incision, and a suture buttoned at each end was placed horizontally above the brow to relieve tension. The different steps in the operation can be more readily understood by examining Diagram No. 2.

A piece of oiled silk, doubled, was placed between the skin graft and the conjunctival lid surface, and the lids were covered with gauze

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Front view after operation with artificial eye in position.

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pads and cotton as after the former operations. With the exception of the cutting out of the suture below the pedicle, healing was perfect and rapid, the skin graft healing throughout with no tendency to adhere to the conjunctiva of the upper lid.

The fourth and last operation was done on March 6th to complete the inner portion of the lid and the superior cul-de-sac. After severing the pedicle the incision was extended downward through the ocular conjunctiva, previously grafted from the rabbit, underrunning a flap which was left adherent to the lid margin. The skin was undermined above and towards the nose, the conjunctival flap inverted, a looped stitch passed through the conjunctiva and skin to hold the former in place. The denuded ocular area was again covered with rabbit's conjunctiva, the gap in the lid margin denuded, brought together with a suture, and reinforced with an adhesive strip. But, even with this precaution, tension was so great that the stitch again cut out on the fourth day, leaving a shallow gap in the lid, which nearly filled in during the healing of the other sutures. Dressings were the same as after the former operation and the result was all that could be desired. A superior cul-de-sac, a quarter of an inch in length, was obtained throughout, with a healthy looking conjunctiva over the site of the tumor. Secretion was no more marked than after enucleation at the same stage; the swelling of surrounding tissues was subsiding; and the upper lid was becoming pliable and drawing into position. Patient was discharged from the hospital March 16th with instructions to flush the eye twice a day with boric acid solution, and to pass a probe under the upper lid daily, to prevent adhesions, should they tend to form.

The child was not seen again until March 31st, when a very satisfactory state of affairs existed. The swelling of the lid was subsiding, and it was becoming quite pliable; the scars were less perceptible; the gap in the lid left by the tearing out of the lower stitch had nearly filled in, so as to be only noticeable, not objectionable; the mucous membrane appeared glossy and healthy, but was still secreting excessively. The superior cul-de-sac was sufficiently deep to allow the insertion of an artificial eye after it had been ground down to one-eighth of an inch above the upper corneal margin, and to a considerable extent in other directions. Instructions were given to insert this artificial eye twice daily, leaving it in place for one hour at a time, and to gradually increase the time until it could be left in all day.

On April 21st the mother reported that the eye had been left in all day, after the first few days; that the secretion was much less when this was done; and that it in no way seemed to irritate the parts or to annoy the child. Photograph No. 2, taken at this time, does not accurately represent the condition at the present time, as the photographer attempted to improve the work of the camera by removing the wart from the left upper lid.

Fully twenty negatives were taken to obtain this result, as it is

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next to impossible to keep the child quiet sufficiently long for even a snap shot, making his effort to beautify the child even more reprehensible, a subsequent sitting failing entirely.

The following report was received from Dr. S. C. Fuller, who prepared and mounted a large number of slides:

"The growth received for examination was 20 mm. long, 6 mm. wide, and 5 mm. thick. Microscopically its external surface is rough to the touch, and while not distinctly hard, suggests a warty growth. (This latter condition may have been due to the fact that the tissue had been partially hardened in formalin.)

"Microscopically the external surface is covered with epithelium which suggests the papillary layer of true skin and which in all probability it is—except that the epithelium is more luxuriant in its growth and the papillæ more villous in character. The stratified epithelia which overlie the papillæ in true skin are absent in this case. There is no invasion of the underlying tissue by the epithelium which is apparently proliferative in an outward direction except at the external angle of the growth where there is evidence of invasion of the underlying tissue; and what appears to be a beginning epithelial degeneration. Beneath the papillæ the connective tissue is in parts infiltrated with leucocytes which suggest inflammatory areas. Here and there may be seen alveolar tissue in some cases containing fat. The alveolar tissue does not constitute a distinct layer, but lies in the midst of muscular fibres which together with other connective tissue make up the most of the growth. Throughout the connective tissue relatively large blood-vessels are quite thickly interspersed. Here and there in the outermost end about 4 mm. from external end of growth small glandular structures may be seen. No mucous membrane was observed. The portion of the cornea examined gave no evidence of inflammation. In fact it was normal."

From this report and from the history of the case it seems reasonable to assume that the growth was an accumulation of embryonic tissue belonging to the ectoderm and the mesoderm, or in other words there was an utter lack of differentiation of these layers in this region, with excessive development. What caused the departure from the normal would be an interesting study for the embryologist, but it would hardly be proper to discuss that point in this paper.

Microscopic section through the ciliary body proved it to be normal, and as the other intra-ocular structures appeared normal, microscopically it can be assumed that the abnormality involved the extra-ocular

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PLATE 4

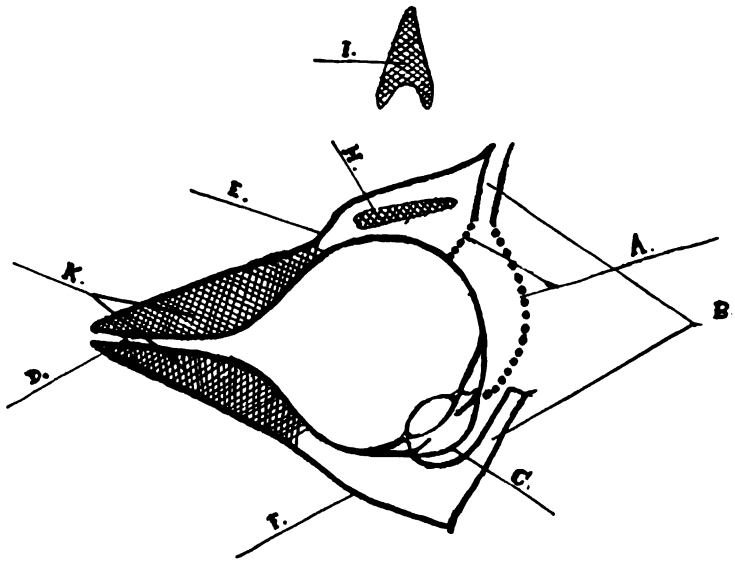

Fig. 1.

Vertical section through lids, eye, tumor, and orbital structure.

Dotted lines, A, outlines of tumor. Continuous lines, B, lids; C, cornea; D, optic nerve; E, superior orbital wall; F, inferior orbital wall. Shaded portion, H, spicula of bone before removal; I, after removal; K, bony formation at apex of orbit.

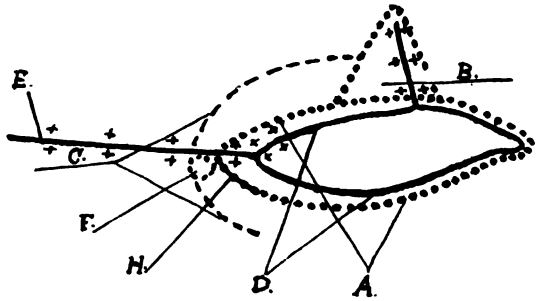

Fig 2.

Dotted lines, A, indicate original position of lid edges after removal of tumor; B, skin graft; interrupted line, C, incision through conjunctiva in superior and inferior cul-de-sacs; F, wart at outer canthus. Continuous line, D, present position of lid margins; E, temporal incision. Connected portion of dotted line, H, at outer canthus, where lid was split to give conjunctiva to form outer port of superior cul-de-sac. Crosses, position of stitches.

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tissues only. Although much could be said of the cranial irregularities, I will dismiss the subject by stating that the child does not show any signs of idiocy but is merely very backward in talking; but as the child is of the female persuasion this need cause no anxiety.

DISCUSSION.

Dr. Helfrich: The Doctor has presented a very unusual and instructive case. Unfortunately, however, the nature of the growth is such that a clear description of it in a paper is very difficult, and on the surface hardly shows the amount of care the Doctor has taken in its preparation. Fortunately, the photographs which you will see as they are passed around, very thoroughly show the good results following the operation. To make four operations, removing the growth and supplying a new lid lined with conjunctiva, is a result the Doctor certainly should be proud of. It is instructive also, inasmuch as the conjunctival grafts from the rabbit were unusually large and thick, and therefore less liable to thrive. Those of us who have had any experience in plastic operations will appreciate some of the difficulties the Doctor had to overcome and did overcome so successfully. It is marvellous that he succeeded in doing all this without the formation of any symblepharon or anchyloblepharon. To criticise any certain plastic operation is like making a good homœopathic prescription: you must see and individualize the case; and not having seen the case, we cannot very well criticize the methods adopted in securing the result he did.

Personally, I do not think it is advisable to perform Mule's operation. These cases heal very satisfactorily, but after a time the sclera is apt to slough, and the glass ball come out, thus defeating the object sought for.

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RATIONAL TREATMENT OF "HAY-FEVER."

By Pierre Colon Moriarty, M.D., O. et A. Chir.,
Omaha, Neb.

THE name "Hay Fever" is a misnomer and its use is excusable only on the ground that, through common usage, it conveys the impression of a given condition. The name suggested by Bishop is acceptable and the only available proper one:—"Nervous Catarrh."

The history and varying theories of etiology and pathology of this distressing fashionable ailment are well known to the profession, as is also the fact that the consensus of opinion declares the condition to be a neurosis.

Dr. S. S. Bishop's excellent little work on the Ear, Nose and Throat presents the best essay on nervous catarrh which I have seen, and to this writer we are indebted for the valuable suggestion of the relation of uricacidæmia to nervous catarrh. While admitting with Dr. Bishop that many cases of nervous catarrh have been cured by the removal of spurs from a nasal sptum, hypertrophies, etc., still I agree with him that the preponderance of evidence points to uricacidæmia as the underlying cause in by far the majority of the cases, and is usually to be found to some extent in all cases. Where we have local points of irritation, their obliteration must generally be accompanied by treatment directed to the uric acid diathesis as well. On the other hand, cases treated constitutionally only (where local interference has been positively objected to) have been materially modified in spite of the local condition. The rational treatment assumes not only the removal of the main, but any and all contributing and exciting causes.

Under ætiology I would place first, uricacidæmia resulting in a hyperæsthetic state of the sympathetic nervous system; and a neurotic temperament. In many cases it is possible to trace back in the individual, and often in the family history, the uric acid diathesis as manifested in a long train of rheumatic and gouty affections and not infrequently choreic phenomena. This latter condition is becoming recognized as a manifestation of a rheumatic diathesis, some authors now claiming that such a source is demonstrable in over fifty per cent. of the cases of chorea.

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Next in importance in ætiology I would place as contributing causes the local lesions, such as hypertrophies of the middle and inferior turbinals; spurs, especially when in contact with turbinals; hyperæsthetic areas; polypi; in importance in the order named.

Lastly the exciting causes are to be found extraneously in dust of any kind, though the pollen of plants, especially the wild weeds, takes first rank as an excitant. An immediate exciting cause is to be noted in the vaso-motor disturbance from the use of ice-cold food or drink. I have noted several instances of the immediate precipitation of an attack after indulgence in ices, etc.

General directions to sufferers from nervous catarrh, such as insistence upon an out-door life, freedom from mental strain, and change of climate at onset of attack, are indeed good and valuable suggestions, but decidedly impracticable in a great majority of our cases. A treatment offering amelioration of suffering, without temporary change of residence, is the treatment sought by the business man and by many who, though participating in the gaieties of a reputed fashionable malady, are still too poor in time as well as purse to avail themselves of the relief offered by the more expensive remedy of prolonged vacations.

Dr. Jonathan Wright* while crediting Bishop's argument with much force, still thinks it too early to judge of the merits of the theory of uricacidæmia being causative in nervous catarrh.

The treatment which I am about to outline is the result of an acceptance of Bishop's theory after careful investigation, and what is still more encouraging, practical application.

The results have been by far better than under any form of treatment hitherto in use, and though not entirely satisfactory in all cases, I have felt justified in casting the blame for failures, in most instances, upon the patients themselves, owing to their refusal to accept in full the rigid rules laid down. In some cases not materially benefited we will learn that some point of contributing irritation has evaded our search and complete relief will not be had until such point be discovered and remedied.

The treatment according to the theory of uricacidæmia as the prime cause, will in my opinion and experience practically cure a majority of the cases and materially ameliorate all; add to this a radical treatment for all discoverable or probable contributing causes and the results are gratifying.

*American Text-book, Eye, Ear and Throat.

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In merely suggesting an anti-uric acid treatment in addition to the local treatment, I do not feel that I would be fairly presenting the reasons for my confidence in results, and therefore ask that you permit a little reference to detail, especially as to specific anti-acid treatment in these cases, the value of which has been fully demonstrated.

In no instance do we see more gratifying results of detailed and faithful observation of the minutest directions, or more discouraging and lamentable failures by ignoring of same, than in nervous catarrh; and my first suggestion to a patient is the absolute necessity to implicitly follow all directions.

To such as will assure us of a willingness to observe these rules, we are almost justified in promising practical immunity.

When possible it is best to examine patients about three months prior to usual date of onset. Get a full history, individual and family, for guidance in individualizing treatment. Any probable contributing causes such as hypertrophies, spurs, sensitive areas, etc., should be attended to at once and in some cases local use of sprays, etc., may be used with benefit. In other words, prepare to have the seat of local manifestation in as nearly normal a state as possible before the onset of the symptoms which mask so effectually underlying conditions.

Dieting is best begun at same time, gradually becoming more rigid as date of expected onset approaches. Taking for example a case under favorable conditions: During the first six weeks I order a rather liberal anti-acid diet, but with a material increase in use of water, and in general avoiding sugars, fats, starches, fermented liquors, sweet wines and malted drinks.

The patient's task really begins after this, as for the next four weeks they are allowed no meats except white meat of chicken and occasionally a mutton chop. Vegetables, mostly of the fresh green varieties, no peas, beans, corn or beets, and potatoes during this period are to be eaten not more than twice a week and then only if thoroughly baked. Farinaceous and bread stuffs in very small quantities. Of fruits the acid varieties only. If patients desire wines, the light sour wines are permissible. Fish and eggs at all times, properly cooked. It seems hardly necessary to say that fried food is absolutely to be avoided, as are made dishes, fresh bread, pastry, etc. Most foods must be warm; none ice-cold. No iced drinks except lithia waters, and then only between meals. Ice cream and ices positively prohibited.

Dating two weeks prior to expected attack food is reduced to eggs and milk only, with occasional toasted bread and acid fruits. Eggs

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may be served in any form, except fried. This limited diet is continued throughout period of usual attack and made less stringent only after first indications of frost, which always relieve local manifestations. Then for a few weeks diet gradually becomes more liberal until restrictions are entirely removed. Patients fear that they will become thin as shadows under such diet rules, but I have yet to see a single instance of a person losing materially in flesh or strength, and in many cases they feel decidedly stronger and even gain in weight.

A rather liberal experience has been productive of preferences with me for certain waters, etc., and these I mention merely as being my favorites: Sparkling Londonderry Lithia has been very satisfactory as a general water. I depend mainly, however, upon Alkalithia, which has a prompt and efficient action and is one of the best effervescent salts I know of or tablets of tartarlithine, used in the morning in hot water, the balance of the day in drinking water; the charged water being used *ad libitum.* However, do not fail to have your patients drink a great deal of water, at least two quarts during twenty-four hours. To meet the inevitable temptation to join in a glass of soda, a good root beer sour, with a little acid phosphate added, is permissible, or sour lemonade. Another useful adjunct to the general treatment is a thorough sweating, either by bath cabinet at home or in public baths, once a week.

In the majority of cases where patients live up to the rules the attack does not come, but if it does, immediately order a tablespoonful of Horsford's acid phosphate taken at bed time in about six or eight ounces of water to be continued nightly during attack. During attack patient is to have local treatment daily; my routine being a thorough cleansing of the nares and naso-pharynx with a solution of benzolyptus or similar antiseptic washes, and then carefully drying with cotton, the application of a little carbolic acid, or iodine solution, followed by a thorough spraying with campho-menthol in oil. The use of cocaine must be avoided absolutely, as the slight temporary relief afforded is quickly followed by a reactionary congestion which is far worse than original condition. The cleansing treatment, furthermore, gives more marked immediate relief than cocaine and is lasting, even being of benefit in cases that have not had the advantages of preliminary treatment and diet.

In the beginning of preliminary treatment I have found *Psorinum* and *Lycopodium* more frequently indicated than any other remedies, and during the attack *Mercurius corr., Arsenicum* and *Euphrasia.*

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The necessity for absolute observance of directions on all lines must be insisted upon, and though much of it may seem to be drawing the lines unusually stiff, you will note that every specified rule has its material bearing upon the starting point of uricacidæmia. During the first year it is indeed difficult to secure in full the coöperation of the patient, but they approach the second year's task with a confidence which is encouraging and willingness to comply with rules in full.

A dozen cases treated under full observance of these rules by patient and physician alike, will demonstrate that uricacidæmia is the prime factor for consideration in the treatment of nervous catarrh.

DISCUSSION.

Dr. W. E. Deuel: I have read Dr. Moriarty's paper with much interest and I hope with profit, because we are all interested in that popular disease "hay-fever." I like the old name the best.

Dr. Moriarty refers to Dr. Bishop's theory of uricacidæmia as the principal cause of this periodic distressing disease. I read Dr. Bishop's papers at the time they were published and always recall it when I have a new patient (which is frequently in central New York), but I am unable to accept the theory as fully as Dr. Moriarty does. There may be no doubt about its being what might be called an auxiliary predisposing cause, but I cannot accept it as the principal cause. The main objections to the uricacidæmia theory is the periodicity of the disease. If this theory is correct, how can this periodicity be accounted for? Why is it that it appears each year with the regularity of time, on the same day and you might almost say the same hour. Why is it that one patient will be attacked in June, another in July, and another in August or September, and continue for a definite time, many times regardless of treatment or no treatment? Why will an August or September catarrh persist until there is a good frost, in spite of all efforts to subdue it? Why will a change of location be it near or far many times control the whole train of symptoms?

I have one patient that if he would live about three miles from his present home during the summer would never have an attack. When he is taken if he will go to this place, a sulphur spring, he will be relieved in twenty-four hours, only to be again afflicted if he returns home.

It would seem to me that if this theory of Dr. Bishop's is correct and that uric acid is so important a factor, why is there such a periodicity in the diseases? Why do we not have it at other times of the year besides three or four months in summer? Why not in winter? Certainly people have uricacidæmia in winter as in summer, and do they not have more in the former season. Since Murchinsen first gave us the uric acid diathesis and the latter was more fully demonstrated

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by the experiments of Hay, it has been assigned as the causes for many diseases, hay-fever being the last.

I have not been able to accept the theory of Dr. Moriarty, and I have brought these questions forward to open the discussion, that I and possibly others may be enlightened.

I am still a believer in the old original pollen theory. I may be a back number but I cannot make the conditions I see every year reconcile with any other theory, why one person has hay-fever and his wife does not I cannot always tell any more than I can tell why one person in a family has typhoid fever and the others do not under the same condition. If I say personal idiosyncrasy I again expose my ignorance. There may be many auxiliary causes, as constitutional conditions, nasal spurs, and hypertrophy and sensitive sections in the nose, which predispose one to an attack, or be good soil on which the poison of the pollen may develop. As to the name, I do not seen why hay-fever is not as good and intelligent as nervous catarrh. It certainly designates the time of year when you can expect the disease and certainly there is much fever during the attack. The former may not be as scientific as the latter but as surely indicates the form of disease.

As for treatment that is as varied as are the subjects. I have used most every remedy in the materia medica. At one time I would get brilliant results, but the next year the same remedy would have no effect.

Dr. Moriarty's preliminary treatment is very excellent but it is difficult to get patients to continue it any given time. In fact there have been so many failures that many people have given up trying to get any relief, except by change of location. As people of the leisure class are more afflicted than workmen, they can enjoy the remedy as it is easy to take.

The intensity of the disease varies each year. Last year we heard of many brilliant cures. This year it may be all failures. This I have noticed many times. I have had best results from *Naphthalin* 3x of any single remedy—*Aresenicum alb. Cepa. Arum try. Euphasin* and many others are good remedies. For local spray, I have relied on hydrochlorate of quinia 1 to 100, and menthol combined with borolyptol. Of course I have done such surgical work as I thought necessary before giving remedies.

Dr. Moffat: In several cases my patients have obtained marked relief from erythroxylon coca in one or other of its preparations—"extract," fluid extract, chewing the leaves, or "maltine with coca wine."

Dr. Shearer: I have been experimenting lately with a solution of supra-renal capsule as a local application in cases of rose cold. One may prepare the solution by adding ten grains of the desiccated supra-renal capsule to one ounce of distilled water, shaking it well and filtering. The preparation is then sprayed into the nostrils night and morning, affording great relief from the constant flow of watery mucus and the frequent use of the handkerchief. It is necessary to prepare the solution freshly every third day, as at the end of that time,

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it becomes turbid and putrescent changes occur, rendering it unfit for use. Various agents such as alcohol, boric acid, etc., have been added as preservatives, but they irritate the nasal mucosa too much. The results obtained were excellent and no doubt the solution would work just as well in hay fever. No deleterious local or constitutional effects were observed.

Dr. Palmer: Dr. Shearer having spoken of a solution of supra-renal capsule, I recall that I saw about three weeks ago a short article by Dr. Lederman of New York, in which he said he had made several experiments and found a way to keep the supra-renal solution, that is by dissolving it in a 25 per cent. solution of glycerine and distilled water. He said he had tried different ways of using corrosive sublimate and carbolic acid, and he had been unable to retain the good effects of the supra-renal capsule until he had made this solution with the glycerine. My experience has been that I can keep a solution of this kind for a little over two weeks.

While on this subject, I will mention that I obtained relief in six cases of hay fever last summer from the insufflation of orthoform used in a 50 per cent. mixture with lycopodium powder, which gave relief for anywhere from 36 to 72 hours. I see in the journals now and then the terms "orthoform old" and "orthoform new;" and, apparently, the action of new orthoform does not last as long as the old.

As to this uric acid theory: I have lately read a book on the uric acid diatheses, in which the Doctor noticed, I think, that there were only two drugs that caused uric acid in the body from poisoning. Those are phosphorus and plumbum. I think if we, as homœopaths, bear this in mind, we might be able to work out some symptomatology, or it might direct our minds to those two drugs in these cases of uric acid condition affecting the nose. I have had some cases in which relief has been secured, though it has not been long enough to make any report on.

Question: Have you used formaline?

Dr. Palmer: Yes, I have used formaline, but not with satisfaction. About all the anti-acids that could be used were tried, but failed.

Dr. Moriarty: The paper mentions only my general diet. In individualizing it is sometimes necessary to give a boiled meat and hot water diet, etc., in accordance with specific individual requirements. These other forms of diet are not frequently called for and so have given details only of most general. I have had no experience with the supra-renal solution but could see where it might be of service. The thorough cleansing, with *drying* of membrane has been very satisfactory even in cases where preliminary diet rules had not been inaugurated.

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EYE-STRAIN AS A CAUSE OF DISEASE.

By Frank D. W. Bates, M.D.,
Hamilton, Ontario.

WE are all familiar with the various discomforts of the eyes, headache, etc., arising from errors of the refraction and insufficiencies of the ocular muscles; but a question of great importance to us at the present time is,—are these anomalies capable of producing disease in organs remote from the eyes? From my own observation during the past four years, I am firmly convinced that such is the case.

I have no new theories of my own to bring forward in this paper, but only wish to present this subject for discussion, that we may have the benefit of each other's views.

Some four years ago I ran across a little book written by a certain Chicago physician, in which the author claimed to have cured various cases of consumption, diabetes, insanity, etc., by performing tenotomies for various forms of heterophoria. His reasoning seemed very plausible to me, and I determined to look into the matter and see whether there was anything in it or not. The first case I looked into was that of a case of diabetes, which he claimed to have cured, and which had previously been under the care of a reputable physician of Brantford, Ont., for four years, without result. I wrote to the physician mentioned, (whom I knew to be of good standing) and received a lengthy reply from him, affirming that it was a true case of diabetes mellitus; that he had been under his care for four years without result, and that after the operations upon his eyes, he had made a complete recovery, and was at the present time (a year or so after the operations) apparently in perfect health, there being no evidence of diabetes remaining. This physician became very much interested in the theory, and wished me if I made any further experiments in that line to let him know the results. I also wrote to several others upon whom he claimed to have operated successfully, and received confirmatory replies from all of them. I then determined to experiment a little for myself.

Case One.—The first case that came under my care was one of diabetes of nine years' standing in a prominent allopathic physician of our

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city. I first saw him on the 22nd of March, 1896. He was in bed, and never expected to be about again. The physicians in attendance said he could not live three months. I let him read the little book referred to, and he being favorably impressed with it, asked me to undertake the treatment of his case on those lines. On examining his eyes, I found left hyperphoria, and put on prismatic glasses, as much as he could overcome, divided between the two eyes, and his condition immediately improved. Within a few days he was able to be out of bed and to go downstairs. The specific gravity of urine, which had been from 1036 to 1040, went down below 1030, and the quantity diminished. Within a few days he was able to go out of doors, and continued to improve, gaining somewhat in flesh (though he was very much emaciated). During the summer months he remained fairly well, being able to attend somewhat to his office practice until September, when as the result of a long drive which tired him very much, he was compelled to take to his bed, from which he never rose again,—more than to sit up for a few moments at a time,—although he lived until the following June,—fifteen months from the time I first saw him.

I should have said that symptoms of tuberculosis had set up in this case before I saw him, which increased after he finally took to his bed. I was not permitted to operate upon his eyes, as the physicians who attended him, assured him there was nothing in the theory. For a day or two before death he saw double, objects appearing one above the other, and on examining his eyes after death, I found one, (the left) turned fully 10° above the other.

Since then I have treated four cases of diabetes in persons aged respectively 52, 40, 31 and 10 years of age. The first of the four has hyperphoria, and the other three had exophoria. On the first I was not permitted to operate, as the friends were all opposed to it, but from the use of prismatic glasses which she has worn for nearly two years, she has very much improved, so that from not being able to do her own work at all, she is now, and has been during all the time I have treated her, able to attend to her household duties. She cannot go long without her glasses, without the symptoms becoming aggravated.

Case Two.—The case of the little girl of 10 years, was a very bad one. I first saw her in August last. Her physician (one of the most prominent in the city of Hamilton) had said to the parents a few weeks previously, that she could only live for a few months, that there was no use in giving her medicine as there was absolutely no hope for her. He regulated her diet, and told them to make her as comfortable as possible while she lived. She was quite tall for her age, but slight,—weighing something over sixty pounds, and had been losing weight for some weeks. The specific gravity of urine had ranged from 1046 to

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1052 ever since they first discovered her trouble. Her mother kept a urinometer and tested it night and morning. On examining her eyes, I found marked exophoria. She could overcome 20 degrees of prism, base in, on first trial, which was soon increased to 30°. I performed a full tenotomy on the external rectus of the O. D.—told them to let her have plenty of fresh air, all the exercise she could take short of becoming tired, and to give her a liberal diet. In addition to this, I put on prismatic glasses as strong as she would take, base in, which was about 10° at first, and gradually increased strength as she would take it, up to 20°. After the first few days, she commenced to improve. The specific gravity of urine gradually went down until, at four months after the first operation, it ranged from 1030° up to 1034°. She gained in weight, up to 70 lbs., looked better, had more color in her face, which had at first been very pale, and felt better in every way, and the acetone which was very strong at first, had entirely disappeared from her breath. About four weeks ago, I operated upon the other external rectus,—making a full tenotomy as before,—with the result of showing about 1° of esophoria immediately after the operation. After she had recovered from the effects of operation, I paralyzed the accommodation and prescribed for a compound hyperopic astigmatism of +50 D.⌒.+75 D.C. axis 90 O.U. the correcting glasses which she is wearing now. Upon last examination all tests, including Maddox rod, phorometer, and tropometer, showed muscles perfectly balanced. The specific gravity now rarely reaches 1030 and she is feeling better and stronger than at any time before,—being able to take long walks and join in the plays of other children without becoming tired, neither of which she could have done six months ago. I have every reason for believing that this girl is going to make a complete recovery.

The other two cases of diabetes I have operated upon were both supposed to be hopeless cases, one being pronounced so by a great English specialist in London. Symptoms of tuberculosis had appeared in his case,—tubercle bacilli being found in the sputa; but since operation I have learned by letter that the cough has entirely disappeared,—though the diabetes still remains. Patient is in England now, and is still wearing glasses I prescribed for him. I hear from him occasionally, indirectly, but have not much hope of his recovery, though he has lived longer now than it was supposed he would live when I first saw him. The other case is also one of long standing (13 years) and far advanced, though her symptoms have improved since operation. I cannot say what the result will be.

Now as to the plausibility of diabetes being caused by eye-strain. We cannot find an article written on diabetes, within the last thirty or forty years, that does not mention various asthenopic and accommodative troubles of the eyes, resulting from the disease. Is it not pos-

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sible that during all these years, we have been "putting the cart before the horse" and that the eye troubles, instead of being the result of the disease, have been the cause of it? I have failed to examine a case of diabetes since my attention was called to the matter, in which there has not been either marked exophoria or hyperphoria.

We all know that irritation of the floor of the fourth ventrical of the brain, artificially produced, will cause sugar to appear in the urine. We know that all the nerves supplying the muscles and accommodation of the eyes arise in, or near, the floor of the fourth ventrical; and also that the pneumogastric nerve arises in the floor of the same. Now, if irritation of the floor of the fourth ventrical, artificially produced, will cause sugar to appear in the urine immediately, why will not irritation produced by continuous strain upon the muscles of the eyes produce diabetes? Or, why will not the irritation produced by continuous strain upon the eyes cause disease of other organs of the body,—of the heart, lungs, stomach, liver, bowels, ovaries, etc., by the irritation being communicated to the nerve centers controlling these organs, according to their susceptibility by hereditary predisposition,—the nerve centers of all these organs being clustered around the base of the brain? or, putting it in another way, would not the extra amount of nerve force required to overcome strain upon the eyes, be taken from the nerve force required for other organs of the body, thereby in time undermining the system to such an extent as to render the person more susceptible to the various germs of disease?

Case Three.—One of the first cases that came under my care in this line, was that of a case of phthisis pulmonalis in a girl of 18 years of age. Some ten years previously, a brother of this girl had died of the same at the age of 16. I knew of the case at the time, and wondered why he should have phthisis, as the father and mother were robust, healthy Scotch people, the rest of the children, (of whom there were eight or ten) were apparently perfectly healthy, and they could not trace consumption on either side of the house. This girl had been to several physicians who had pronounced it consumption, said that one lung was entirely gone, and that she would probably not live more than three months.

I examined the case, and found her in the following condition. She was small in size, being 4 ft. 11 in. in height, had run down in weight from 113 to 78 lbs., had had profuse night sweats for months, coughed and expectorated a great deal, apparently did all her breathing with the right lung—the left side of chest not expanding at all,—breathing at the rate of sixty respirations per minute, with pulse at 120. She was very weak and ate very little, and the least exercise tired her out. I

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asked her if her eyes troubled her, and she said they did not. She read considerably, with very little discomfort except an occasional headache. The vision was $^{20}/_{20}$ in each eye, with a slight astigmatism. Upon examining the muscles by the covering test, when the left eye was covered and she looked at a given point with the right eye, the left eye remained in line, but when the right was covered and she looked with the left, the right eye turned up fully fifteen degrees. I put on prismatic glasses of fifteen degrees, dividing it between the two eyes, base down before the right, and up before the left eye, and told her to report in two days.

She returned the third day with a marvellous change in her condition. Her night sweats had entirely stopped, she was breathing at the rate of 26 respirations to the minute, instead of 60, and taking apparently as much air into the left lung, which was supposed to be gone, as into the right one, was feeling better and stronger in every way, and appetite had increased. I had her continue with the same glasses and report every few days. Things went on in the same way for about six weeks,—night sweats did not return. She gained in flesh, so that at the end of six weeks her weight was 82 lbs.,—a gain of four lbs. Still her cough continued about the same. I knew that something more was to be done, but did not know exactly what to do. I examined the eyes again, and found some esophoria. Having no combination prisms I took off the prisms up and down, and put on prisms with the base out, telling her to report again in two days. Did not see anything more of her for two weeks, then met the sister on the street and asked her how Janet was. She said "Oh; poor Janet is done for, I guess." I think she must have caught cold the last time she was up town, for when she went home she had to go right to bed. The cough came back as bad as ever, the night sweats returned, her legs became swollen, and poor girl, we think she will never get up again." I asked why they did not let me know before, and she said they had thought it was no use. A pair of glasses was a pair of glasses to them, and they saw no difference between the glasses she had been wearing and those she was wearing then. I told them she had probably not taken cold at all, but that it was probably the change in glasses, that had caused the change in her condition. I told her to send those glasses back, and that I would send her another pair. The next morning by first train, the glasses came back, and I sent her the same glasses she had had at first, with the result that in two days she called at my office again, as well as before, night sweats gone, cough diminished, swelling gone from her legs, and feeling as well as before the change in glasses.

This patient lived for thirteen months after I first saw her. I was not permitted to operate upon the eyes, as kind friends had said to the family that I would ruin her eyes, and the family physician had assured them that there was nothing in the theory, and that the fact of her being better after wearing the glasses was merely a coincidence,

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and due to the fine weather and the medicine he had given her. But I am strongly inclined to believe that had I operated upon that superior rectus muscle, the final result might have been different. Another sister in the family is now showing symptoms of consumption, and I expect to have her under my care before long. The mother has assured me that if the symptoms develop, I may operate upon her eyes if I think best to do so. I know that she has muscular trouble, as I discovered the same when prescribing glasses for her some two years ago.

Case Four.—Another case on which I operated successfully was that of an unmarried lady of 29 years. She had been running down in health for some six years. Had been examined by several physicians, but none of them had been able to diagnose her case, said there was no organic trouble discoverable, but a tendency to ovarian trouble. One physician had suggested a removal of the ovaries, if she did not improve before long. Six years previous to the time, I saw her, she had been a robust, healthy girl, weighing 145 lbs. from which she had gradually run down to 107 lbs. could do no work about the house without being used up, could not walk any distance or go out to spend an evening without being used up for several days thereafter; in fact was practically an invalid. Her bowels were constipated, she had considerable pain in the back, and a tenderness in the ovarian regions, which at first was during her menstrual periods, but latterly all the time. Upon examination of the eyes, I found marked exophoria, so much so, that within a few days she could overcome 25° of prism, base in, and wear glasses of that degree with comfort. I performed a full tenotomy of one external rectus, showing slight esophoria immediately after the operation, which disappeared within a few days. She commenced to improve immediately after the operation,—among the first evidences being a relief of the constipation and tenderness in the ovarian region; within three months after the operation, she had increased in weight to 123 lbs. was able to take long walks, and do work about the house without becoming tired; wrote me that she felt better than she had for six years, though still had some pain in her back. Her father, who is a clergyman, called at my office about this time, and thanked me for what I had done for his daughter, saying that no medicine she had ever taken for her trouble had done more than give her temporary relief. Last month she came down and spent four weeks in the city under my care, and I performed a partial tenotomy on the other external rectus. Have not heard the result of last operation.

I have performed several other similar operations during the past year with more or less beneficial results, and have interviewed a number of persons who have been operated upon by Dr. George T. Stevens of New York, and others, where the results have been very brilliant, but have not time to enter into details now, as my time is limited, and

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this paper is already longer than I intended it to be. But I may mention in reference to the claim made by Drs. Stevens and Ranney of New York, that a large percentage of insanity is caused by strain upon the eyes, that during the past year I have examined after death the eyes of all the inmates who have died at a certain large insane asylum in our city, where there are from 800 to 1000 inmates, and have failed to examine a single case where the eyes have been in line, though they had been perfectly straight during life. In the majority of cases, the eyes have been turned outward, in others one above the other, but never convergent. I have also examined the eyes in several cases of suicide, and have found them out of alignment. Some may say that the eyes are often out of alignment after death. Even so; if the muscles were well-balanced they would not be so, and we cannot say that the expenditure of nerve force required to keep them in line during life, was not the cause of the person's death. Dr. Ranney in his book, very aptly likens the expenditure of nerve force to a child being born into the world with a capital of $100,000, saying that if he does not encroach upon the capital more than at the rate of $1000 a year, he will live to be 100 years old before he will become bankrupt. But if he encroaches upon the capital at the rate of 5000 a year, before he reaches his majority bankruptcy will be staring him in the face.

Drs. Hansell and Reber, in their book, take exception to the claims of Drs. Stevens and Ranney, that a large percentage of various diseases are due wholly to eye strain, saying that the theory is dangerous and unsound. But facts are stubborn things; and if in a large percentage of said diseases, the patients have been cured by relieving the eye-strain after medical treatment has failed to cure them, it seems evident that the relief of eye-strain has removed the cause of the disease. I am not one of the "Tenotomy Enthusiasts" mentioned by Drs. Hansell and Reber. I know there is a tendency in all specialties to exaggerate anything in their line as being a cause of general disturbance to the system, and this of course must be guarded against; but at the same time, we know that the eyes do more work than any other organ of the body. When we sit down our body is at rest; but the eyes are continually at work from the time we open them in the morning until we close them at night,—and we have reason for believing that latent muscular troubles are at work even when we are asleep. If the refraction is at fault, or the muscles unbalanced, it must require an extra amount of nerve force to overcome the same; and where an extra amount of nerve force is required in any direction continuously, it

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must in time undermine the system so as to make the person more susceptible to disease. Now, in closing I wish to suggest an experiment in reference to the insane. If the eyes are out of alignment after death, why would they not be so during life under the full influence of anæsthesia? I am going to try the experiment the first opportunity that offers. There are two cases I have in view now, of persons who have been in an insane asylum for several years, and are supposed to be hopeless cases. If I am permitted to do so, as I think I shall be, I intend to put them under the full influence of anæsthesia, and if I find the eyes out of alignment, operate upon the muscles until I get them as nearly in line as possible. I hope to be able to do this before the meeting of O. & O. Society in June, and if so, will report the result.

DISCUSSION.

Dr. Norton: I hardly know what to say in regard to this paper. It certainly has opened a field to us that is probably new to the majority, as it certainly is to me. The results he has secured seem somewhat miraculous to those who have not worked in this field; and it certainly is a subject that seems to me worthy of careful thought and investigation by the members of this Society. While I am not prepared to go on and endorse the theory that we can cure diabetes, phthisis, and everything else under the sun by operating the muscles of the eyes, or correcting them with prisms—at the same time, I believe there is a possibility that the eyes may have a great deal to do with it. I do not believe there is any one in the room working in the eye line, but has seen a great many interesting and peculiar results from the correction of muscular deviations or correction of astigmia. I have myself noticed a number of cases of epilepsy where the attacks have certainly ceased after the use of proper glasses correcting the muscular trouble and the astigmia as well. I have seen a number of cases—I say a number—perhaps a half dozen women at different times, who, after putting on proper glasses, had several months later told me that since wearing the glasses, they had been entirely relieved from menorrhagia from which they had suffered for several years, and for which they had had all kinds of treatment; and that while wearing the glasses they had not had treatment of any kind. Whether these things are coincidences, or whether it is due to correction of the nervous loss, I cannot say. My opinion is that the nerve strain from the errors of the eye was the cause, and after their correction they have been relieved. I recall one case of a gentleman who had been examined by such eminent men as Spitzka and Seguin at least ten years ago, and told that he was going to be confined in an asylum in six months. That case was referred for examination. I found but a slight shade of astigmia, but proper glasses were prescribed, not anticipating that the eyes had anything to do with his

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mental condition. The man is now well and able to do his work as banker and broker, and has never had any of his old symptoms tending toward insanity since wearing the glasses. I could go on and mention innumerable cases of reflex disturbances that have certainly disappeared after the correction of eye-strain, and I am not prepared to say we cannot go on in this same line and expect results in these more serious conditions. Who can say that long continued strain upon the nervous system from any cause may not finally result in organic diseases that could be obviated and relieved by proper correction of the cause? I have not been an enthusiast upon the cutting method of treating these cases. I have done my share of it, perhaps, in the earlier years, but I now believe better results are had from correcting it with prisms, either in systematic exercising of the muscles, or by wearing prisms together with the glasses for refractive error; and I do not see the necessity of going on to so much operative work. Dr. Bates records one or two cases that he was not permitted to operate. I do not understand why he should want to operate when he was able to correct the trouble with prisms. If we can bring the eyes to orthophoria by a prism glass, I do not see why we are not getting just as good results and can expect to receive the same benefit as when correcting the trouble by an operation. It has been a very interesting subject to me, and if I get an opportunity with any of those diseases (which I probably shall not) I shall try to follow out some of Dr. Bates' principles and see whether there is anything in it.

Dr. James: I have seen frequently these deviations pass away under the wearing of a glass that would correct a very small amount of astigmia. It is so in nervous temperaments, especially in young ladies at a period when they are extremely nervous, where the correction of a very small amount will soon relieve all the nervous symptoms, and thus you cure the case and the beginning of muscular deviation will pass away, as I have seen time and again under a small error of refraction which one can easily correct. Not only that, but I think we must not only give the correction by glasses, but for the reflex symptoms present (and many of them are very persistent after they begin,) we must not forget our homœopathic remedy. I have seen symptoms pass away under the action of properly selected remedies, especially those acting particularly upon the nervous system and brain—the more delicate nerves of the eye and the ciliary regions. I have seen quick action from some remedies in clearing up all the balance of the symptoms that do not pass away under a proper correction of the refraction.

Dr. Moffat: It is an old story that the slighter degrees of astigmia or heterophoria are more prolific of reflex disturbances. If Dr. Bates had carefully re-examined his patient at the time the latter grew worse he would possibly have afforded further relief by a change in the prisms. Prismatic glasses should be but a temporary expedient to be carefully watched and frequently changed. Their curative effect depends upon bringing the visual axis so near the macula lutea that the proper extrinsic muscles make the two coincide in the effort for

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monocular vision. Otherwise the prism only confirms the distortion of the eye.

Eye-strain may well be a contributing factor in the causation or perpetuation of diabetes. The successful tenotomies are mainly in cases of malformation. It is ridiculous to cure a weak muscle by weakening its opponent. We should never operate without first thoroughly measuring each muscle's strength and correcting any error of refraction.

Dr. Thomas: I have to confess to a feeling of skepticism with regard to this subject. In diabetes, we have as we all know, to deal with a disease that is extremely variable in its course; its natural history shows it as such, and it is therefore difficult to say how much these cases are really influenced by the various measures that have been proposed for their relief.

I happen to recall an extreme case of diabetes in which apparently a suggestion had a most beneficial influence. This gentleman, who was confined to his bed hopelessly ill with this disease was told of a similar case cured by eating molasses candy.

He immediately invested largely in the remedy, and was soon most remarkably improved. With reference to epilepsy, I feel very much the same. I doubt whether true epilepsy has been cured by the adjustment of either the refraction or muscular errors—though "convulsive attacks" may have. There is certainly a difference between epileptiform seizures and true epilepsy—but the resemblance is often so close as to lead to error.

As I understand it true epilepsy is usually a very slow disease, beginning with widely separated convulsions, and complete loss of consciousness; the patient feeling perfectly well in the intervals. While in convulsions from reflex causes, there is almost always a constantly existing impairment in health in some direction or other, depending on the seat of the reflex; frequent attacks, and commonly but partial loss of consciousness.

Such cases have been relieved or cured by the greatest variety of measures, both mechanical and otherwise, depending, again, upon the seat of irritation, and it is my opinion that it is to this class of cases that the so-called cures of "epilepsy" by treatment of ocular errors belong.

Dr. Anderson: I, too, with Dr. Thomas was a doubting one some time ago. My attention was called in this direction shortly after or about the time Dr. Bates was, and I can confirm very much of what he said in regard to his experience in curing such nervous troubles, by the operations upon the recti muscles. As one lady said to me, as I explained the matter to her, "Well, Doctor, that is too good to be true, —that a person can be relieved of diabetes and these other troubles by relief of the eye muscles." I have operated several times along the lines of Dr. Bates' paper, and I must confess with most uniformly satisfactory results. One case of a young man that came to Toronto from Chicago, who was broken down in health from asthma with fainting, and dizzy attacks, so that he would fall down at his desk in the bank

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in Chicago, where he held a very responsible position. He had to leave his business and come to his friends in the city where I live. He would have these attacks periodically. Then he would have so much congestion, apparently, of the brain, that for hours the only relief he could get would be from ice applications to his head. He had one of the best prescribers in our school prescribe for him with no practical result. He had tried the old school physicians also, and they came to the conclusion that he had a tumor of the brain, causing brain pressure somewhere. Some one suggested that perhaps he might have some trouble with the eyes; and he went to a specialist who examined them and said they were all right. He went on with these distressing symptoms rather increasing, until he was subject to attacks in the street. He had to catch hold of a building, fence, or tree or something to keep from falling, not being able to work at all. Finally he came to me. I examined the eyes, and found he had about 1½ diopters of hyperopia and apparent esophoria. I found that it was a case of reverse strain of the internal recti muscles, and by testing with the various appliances I found that he had really exophoria. In a few days he was able to overcome a prism of about 30 degrees, with the base in, and, as I turned his eyes out, his symptoms began to be relieved. As the result of the treatment along those lines, he entirely recovered from all his untoward symptoms, and is apparently a well boy to-day, a result due entirely, I am sure, to the treatment of his eyes. Another case that was very interesting to me and which turned out with very satifactory results, was a lady with chronic eczema. This may seem entirely foreign to this trouble, but her physician thinking, perhaps, it came from defective assimilation—some digestive trouble producing a uric acid condition (and we know that this condition often produces eczematous conditions) she was sent to me. This lady also had gone the rounds of the schools and had had everything done for her, both abroad and at home. I found a very similar condition to the above mentioned case, viz., very marked exophoria. I explained to her and her friends, and her physician, that I would not say that the relief of these muscles would cure the eczema; but I did not believe that with that manifest nerve strain, she would get well without it. I tenotomized the external rectus muscles of the right eye. She came to see me about three weeks ago, and I found her almost entirely well.

Dr. Hasbrouck: I am hardly prepared to believe all that Dr. Bates has stated. Personally, I know that diabetic cases are very erratic. At the present time I have under my care a patient with exudative iritis who has suffered with diabetes for twenty-five years. She has had a diabetic coma time and time again, and when I saw her first her family physician thought that she would not live the week out. At my first visit the anterior chamber was muddy, and the iris bound down. It was utterly impossible to get a retinal reflex. She could hardly tell daylight from darkness. I saw her again yesterday morning; that is, five days after my first visit. The pupil was nicely dilated, and we could get a good retinal reflex, and she could distinguish objects in the

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room. Inside of two or three days from the time of my first visit physically she was ready to get up and do her house work she said. Time and time again, in the last twenty-five years, she has had such severe attacks that everybody has given her up. She has had Doctors from New York, Boston, Geneva, and London, and all at the time of her severe attacks said she could not live any length of time; but she is still alive and active after twenty-five years of diabetes.

In speaking of nervous cases, we all have seen and have cured these where there was a low degree of astigmatism, or hyperphoria, by the use of glasses.

I have had one case that insisted that he had eye trouble, even though Doctors in Boston, New York, and even Stevens said he did not have any eye trouble; but he insisted that all his nervous symptoms came from his eyes; and he finally got a pair of absolutely plain glasses which he has been wearing, to my knowledge, for eight years; and, so far, he has been able to do his work and has not lost a day. Whereas, previous to this time, for three years he was laid up with headaches, and had to give up his work two or three times a week, and would have lost his position if his father had not been one of the directors in the bank. He was a bank clerk, too, and to-day he is wearing absolutely plain glasses. I saw him within three or four months time and he wanted to know if it was not time for him to have presbyopic glasses. I told him no, because the plain glasses had cured him and kept him well for eight years: whereas, all the oculists and opticians in the country had not succeeded in finding any eye trouble. I also remember well, some ten years ago, a man came to my office, after having consulted two or three other physicians in our city, suffering with the worst kind of hysterical nervous symptoms: he would fall down in the streets and be carried home in the express wagon, or the ambulance would be sent for him. This meant all kinds of hyperphoria, esophoria and various other things from different doctors, and each had been corrected by prisms. I don't know whether anybody ever operated on his eyes or not. I corrected his astigmatism and hyperphoria without result. He went to Boston where Dr. Derby put him in his private hospital, and told him he had a severe form of treatment to give him. He was put in a dark room and told he could not leave until he went through a systematic treatment. The doctor blistered his eyelids and he said he was no better and begged to home, but the Doctor said "No, you can't go: I have got to leave this on. The only way is to apply it three different times." At the end of the second process of blistering he left the hospital, and that man has continued to do his work for the past ten years without wearing glasses. It was a case of hysteria and was cured when he gets a good blistering; or, in other words, a first class spanking was the only thing needed.

Dr. Philips: I do not believe we have any subject of more interest than this. There has been opened by the writer of the paper a very strong point, and that is this: It has been found that the irritation of certain parts of the brain produces certain results in different parts of

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the body. As the writer says, if that be true, and an irritation here occurs from some other cause, why not the same result? It is a point that is a very strong one. In regard to diabetes, I do not know but all may be true that he has said. My experience in that line has been limited to one case. The error of refraction had not been corrected until I saw him. He had no further trouble in that regard: but it made no difference whatever as regards the symptoms of the disease, and he subsequently died. It would not seem to be reasonable to expect any great modification of the symptoms from relieving the eye-strain after the disease had become well established, as it was in this case.

Dr. Bates: Regarding the matter of diabetes I would say to all these "doubting Thomases" and skeptics that I meet a great many of the same in Hamilton. A certain allopathic physician said last week to a patient of mine that "a man who would think of curing a case of diabetes by operating upon the eyes must be a fool." At the same time I believe that the theory is right; and shall continue to believe it until convinced to the contrary. The very ones who oppose the theory cannot and will not even attempt to tell us what is the cause of the disease. Why should we throw aside without investigation, the most plausible theory as to its cause that has ever been brought forward? I expect to see a number of cases of diabetes during the next year, and shall do my best to ascertain the correctness or incorrectness of the theory. I trust that every one belonging to this society will do the same, for it certainly is a matter of great importance to all of us.

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STRABISMUS: CAUSES OF AND METHODS OF TESTING FOR.

By William R. King, M.D.,
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IN the division of the general subject of strabismus, I opine that I have been assigned the portion most easily disposed of and yet the most difficult one upon which to present any original thoughts regarding it.

I have not I believe discovered any new causes for this troublesome ocular defect, neither have I devised any new methods to be used in testing for strabismus. This paper then will be largely a brief review of the subject, designed to refresh in your minds the important requirement preliminary to undertaking the treatment of a case of strabismus; namely, the proper diagnosis of each individual case.

Strabismus, or squinting, is described as an inability to bring the visual axes of both eyes to bear simultaneously on one point, the axis of vision of one eye always deviating in a certain direction from the object. (Foster.)

As to causes, before considering these, it may be well to speak briefly of some of the more important varieties.

Convergent strabismus is the variety in which one eye deviates inward toward the nose, so that its visual axis when prolonged crosses that of the other eye in front of the point of fixation.

Divergent strabismus, in which one eye deviates outward toward the temple, so that the optic axes never meet.

Strabismus deorsum vergens, in which the squinting eye turns downward below the point of fixation of the other eye.

Strabismus sursum vergens, in which the squinting eye turns upward beyond the point of fixation of the other eye.

These forms are again divided into numerous other varieties and which are designated according to character and cause.

Concomitant strabismus is that in which the movements of the squinting eye accompany those of the normal one. When the affected eye is used for fixation the associated deviation of the eye generally used for fixation is equal to the usual deviation of the squinting eye.

Unilateral strabismus is that in which the transfer of the squint from

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one eye to the other never occurs spontaneously, but is induced by covering the eye ordinarily used in fixation.

Paralytic strabismus is due to paralysis of an ocular muscle. It is distinguished from the concomitant form by the fact that the deviation occurs only when the eye is turned in the direction in which the paralyzed muscle would normally turn the eye, and that this deviation instead of being constant, increases more and more as the eyes are turned in this direction; later on it is increased by spastic contracture of the antagonist of the paralyzed muscle.

Dynamic strabismus is a tendency to convergence or divergence which under ordinary circumstances is overcome in the interest of binocular single vision, but which can be detected by the use of vertically refracting prisms. This practically describes a condition of so-called heterophoria.

There have been described a number of other forms of strabismus, such as apparent, intermittent, spastic periodic, etc., but the above described divisions will suffice for the objects of this paper.

The causes then of strabismus may in a general way be stated as, (1) The weakness of some one of the extraneous ocular muscles, (2) Paralysis of one of these muscles, (3) A faulty insertion, or (4) the result of an over action of one of the ocular muscles. *Apparent strabismus* is not considered in this class as the muscles are not at fault but the cause lies in a retinal incongruence.

Nerve energy for the ocular muscles we must remember, is furnished as follows. The internal, superior and inferior recti, also the inferior oblique as well as the levator palpebræ and the sphincter pupillæ and the ciliary muscles derive their innervation from the oculo-motor nerve. The external rectus is supplied by the abducens and the superior oblique by the trochlear nerve. All three of these nerves originate at a point on the floor of the fourth ventrical; the oculo-motor in front, the trochlear just behind it and the abducens, quite well back.

The muscles are divided into pairs which have an antagonistic action to one another during their contraction. The internal and external recti rotate the eyeball in different directions around an imaginary vertical axis.

The superior and inferior recti rotate the eyeball around a horizontal or frontal axis. The superior and inferior oblique muscles rotate the ball around the so-called sagittal axis, (antero-posterior).

The internal and external muscles are the only ones which are perfect antagonists. The superior and inferior recti, owing to the general

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direction taken by the muscle in its course from the apex of the orbit to its insertion tend to slightly adduct the eye.

The oblique muscles owing to the point of their insertion being posterior to the axis of rotation, tend to slightly abduct the eye by drawing the posterior segment inward, thus rotating the cornea outward a trifle. These facts should always be considered in testing, especially for es- or exophoria,

It must of course be remembered that in the normal state the eyes exhibit a perfect muscular equilibrium. This state of perfect equilibrium is the result of the varying amount of innervation or nerve force given to each muscle in proper proportion one to the other.

A normal muscular equilibrium is necessary to accomplish normal binocular vision. It may be said by way of reminder that the ability to see singly with both eyes directed toward an object, does not of necessity indicate binocular single vision. In this latter state the patient fixes correctly with both eyes, and the impression of the object seen is made upon identical points on the retinæ. Single vision is also present when one of the two eyes fails to see, either being blind or it suppresses the received impression; this is actually monocular vision.

To differentiate, we direct the patient to gaze steadily at an object, a lighted candle some metres distant. If it be seen that one of the eyes is somewhat deviated, binocular single vision is not possible. If single vision does not exist, however, it must be that one eye is amblyopic, or that the image is suppressed in the deviating eye.

Frequently manifest deviation cannot be demonstrated on inspection. In this case we test for binocular single vision as follows. While the patient watches a given point intently we cover one eye and then the other. If normal position is maintained after covering we have probable binocular vision. Supposing, however, the right eye deviates outward when the object is fixed by the left eye; should we now cover the right eye the left would remain immovable in the act of fixation, whilst if we cover the left one the right will be seen to move inward to a position of fixation by a motion of adduction. This movement of adjustment is still visible when it is impossible to demonstrate any deviation by ordinary inspection. Another practical test to determine whether single vision is due to a normal fusion of the images or to the fact that but one eye sees this given object through suppression or neglect, is as follows. A prism, base downward, is held before one of the eyes. If there was binocular vision before, two images would now be seen situate one above the other. If, however, there still remains

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single vision it can only be so because the image in one eye is suppressed or neglected.

Binocular single vision presupposes also solid or stereoscopic vision. Thus we may test with stereoscopic pictures, special varieties having been made for this purpose.

We have binocular double vision then when one of the two eyes leaves the correct position of fixation. This is most frequently due to disturbances in the muscular apparatus such as contractures, relaxation or paralysis of some of the ocular muscles. The eye, however, may be forced out of its normal position mechanically by means of pressure from orbital tumors or localized extravasations. Double vision is also found where the excursions of one eye are limited as compared with those of the other by external mechanical obstacles, as symblepharon or by pterygium.

Double images interfere with vision and are abhorent to the eyes, thus every one tries to avoid them. This is done by an effort to bring the eyes by suitable muscular effort into such proper position that the images coalesce. This function of the eyes is termed the *tendency to fusion.*

In a case where the right eye is covered, an object fixed and the cover then removed displaying an inward movement of this eye it indicates that the external rectus muscle is the more powerful and while with both eyes opened the internal rectus was able to overcome the tendency to deviation to prevent the abhorent diplopia, it is accomplished only by an extra innervation of the fibres of the internal muscle to oppose the preponderance of the external. This disturbance of equilibrium of the ocular muscles constitutes what is known as *insufficiency.* This may occur in any direction according to the muscle most involved. When still existing in a degree wherein diplopia can be prevented by extra effort of the relaxed muscle, we have no true strabismus, but what has been turned heterophoria, or latent or dynamic squint.

High degrees of insufficiency often pass into strabismus proper. The impulse for the transformation of this latent strabismus into the manifest form is often furnished by the fact that in one of the eyes the visual power is reduced so that binocular vision is of less use or may be actually abolished. For this reason blind eyes are often found to deviate more or less in some one direction.

In paralysis of an ocular muscle the movements of the eye toward the side corresponding to the paralyzed muscle are diminished or abrogated. If the external rectus of the right eye is paralyzed completely

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that eye can be brought only to the median line and not beyond it to the right.

When paralysis is of less degree the motor disturbance is of course less marked but according to the same mechanical rule.

The result of this limitation of motility is a lagging behind of the eye when an associated movement is initiated within the sphere of action of the paralyzed muscle. This squinting takes place only when the eye is turned in the direction of the sphere of action of the affected muscle and is more pronounced the farther the eye is moved toward this side; but in all other directions in which the paralyzed muscle does not have to act the eyes stand in their proper relation. By this fact paralytic squint is distinguished from ordinary or concomitant squint, which is present in all directions in which the eye is turned and always in the same degree.

In strabismus concomitants we have true squint, and the simplest method for testing and measuring the same as follows. The patient is made to fix his gaze upon a given object placed in the median line between the two eyes, several meters distant. Suppose the left eye fixes the object properly while the right eye squints or deviates inward. We may now mark by an ink dot upon the border of the lower lid the position of the external margin of the cornea in both eyes. We next cover the left eye which has been fixing the object with a screen, telling the patient to find the object again. To do so he must use the right eye for fixation, and this brings it into correct position by a distinctly visible movement of redress. We again mark the position of the outer margin of the cornea of this eye by an ink dot upon the edge of lower lid; the distance between the first and second dot gives the linear measure for the deviation of the squinting eye; this is the *primary strabismic deviation.*

As the right eye is being brought into position of fixation the left eye moves inward behind the screen and is now in a position of *secondary deviation.* While in this new position the location of the outer margin of the cornea of this eye is marked by an ink dot and the distance between the first and second dot gives the magnitude of the secondary deviation. In this instance the primary and secondary deviation are equal whilst in paralytic squint the secondary deviation is always greater than the primary.

In the beginning of strabismus there is present more or less diplopia; this soon disappears and afterwards can only be evoked by all sorts of artifices or frequently cannot be evoked at all.

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In paralytic strabismus the diplopia remains a very annoying symptom.

A patient with concomitant squint fails to see double because he learns to suppress the impression conveyed by the squinting eye. This act of exclusion is a physical one as the squinting eye really does see but the visual impressions set up by it are suppressed involuntarily. As a result of this the patient has monocular vision; he does not therefore have stereoscopic sight in the proper sense of the word.

The visual acuity of the squinting eye is of course diminished. In fact the function was most likely enfeebled before the eye squinted and this enfeeblement is frequently the primary cause of the squinting. The visual acuity lessens more and more with the length of time the strabismus exists until we have a complete amblyopia exanopsia existing. Such an eye has lost or forgotten its ability to perform fixation and there is no motion toward fixation of the object when the sound eye is covered.

When the same eye squints at all times we have monolateral strabismus. When the two eyes squint alternately it is termed alternate strabismus. In the latter class of cases it is usual that one eye fixes for distant objects while the other fixes for near points. One eye always fixes, it never happens that both squint at once. Occasionally we find squinting occurring only at intervals or it may be present at all times; thus we have *periodic* and *constant strabismus.*

Strabismus develops from insufficiency and is really insufficiency or latent strabismus become manifest. This transformation of an insufficiency into a strabismus is effected by such circumstances as reduce the desire for binocular single vision; that is such as render diplopia less annoying, as for instance, any reduction of the visual acuity in the affected eye. Thus we see a patient who has all along had an insufficiency become strabismic when corneal opacities are left as a result of a keratitis in one eye.

The most frequent causes of strabismus through loss of visual acuity are: (1) Errors of refraction present in one eye alone, or to a higher degree in the affected eye, in conjunction with this error there frequently exists a congenital amblyopia. (2) Opacities in the refracting media, especially the cornea and lens. (3) Intra-ocular diseases, as choroiditis, retinitis, etc.

Strabismus is therefore the result of two general factors, diminution of visual power of one of the eyes and a pre-existing disturbance of the muscular equilibrium. According as the latter factor consists

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of a preponderance in the internal or the external rectus muscle, a convergent or a divergent squint is produced.

Convergent strabismus occurs especially in hypermetropes. Donders was the first to claim this and explains as follows, briefly, hypermetropes are forced to a strong effort of accommodation to see distinctly and as the relation existing between accommodation and convergence is so intimate that the contraction of the convergent muscle accompanying efforts at accommodation produces a preponderance of contraction upon the internal rectus muscle. This preponderance of the internal muscles of the eyes develops into a strabismus; if one of the eyes from the time of birth has a more feeble vision than the other, as for instance, on account of higher degree of hypermetropia or hyperopic astigmatism, or if through subsequent disease the visual power is impaired. Convergent strabismus usually develops between the age of two and six. Usually it is first noticed only when fixing for near objects (periodic squint). This may remain the case but usually it develops into a constant squint.

Very rarely it occurs that children with strabismus gradually cease squinting as they grow older, and lose their strabismus about the age of puberty. Thus they "out grow" their squint. The eye, however, which has squinted never regains normal vision; thus accurate binocular vision is never restored.

In divergent-strabismus myopia plays the part of a causative factor instead of hypermetropia. The myope in viewing near objects uses little or no accommodation, thus the reflex impulse for convergence is too weak; there is functional insufficiency of the interni. To this are added mechanical impediments, which interfere with convergence as for instance the elongated eyeball of myopia.

As young children are never myopic, divergent strabismus does not form until later on, during youth when myopia itself develops. As the myopia increases the accommodative strain and with it the impulse for convergence steadily decrease while the demands made upon convergence increase in proportion owing to the approximation of the near point. Ultimately the weakened power of convergence must fail to answer the extraordinary demands made upon it and we have a consequent divergence of one of the eyes. A spontaneous cure such as is sometimes seen in convergent squint never occurs in the divergent variety; on the contrary it will usually increase with age.

I sincerely hope that this brief review of this subject will serve its

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undoubted purpose and refresh the minds of those present as a preface to more original work in the line of treatment of this quite prevalent affection.

DISCUSSION.

Dr. H. I. Jessup: After Dr. King's very thorough paper it seems superfluous to make any further remarks regarding the causes of strabismus and the method of testing for it.

A discussion of a paper as I understand it, has for its object the bringing out from the different men present their individual opinions. I will therefore venture to give mine on the above subject, preceding them however by the statement that I know myself to be very fallible and will be glad to be set right by the rest of you, whenever I have formed any wrong conclusions.

In all that has been said by Dr. King on insufficiency (heterophoria) as a cause I agree most heartily and would like to add to the factors which may correct an insufficiency into a strabismus; the wearing of a bandage over one eye for a number of days. I have seen this occur twice in Dr. Thomas's clinic—both times in children who were being treated for corneal ulcers. In both cases a convergent strabismus developed which only subsided *after* the discontinuance of the bandage and the atropia. There are cases on record of permanent strabismus being developed in this way. Here of course the only possible explanation was esophoria which became a manifest squint through the eye being turned in so long under the bandage, i. e., excluded from use for days. I believe we must also add as a factor in such cases the poor vision from paralysis of the accommodation. In speaking of *apparent strabismus,* Dr. King refers to it as a *retinal incongruence.* With this view I cannot agree, as I consider the apparent convergence or divergence to be due to a change in the size of the angle A. (the angle bound by the optic axis and the visual axis) produced by the length of the eyeball. Thus in H. the angle A. is larger than in E. and in higher degrees of H. we will appear to have a divergent squint. The cause of this occurs in some cases of myopia.

Regarding the measurement of the degree of squint, I have found it very convenient in cases in which diplopia existed, to find what degree of prism would produce fusion. If no diplopia exists I have found the perimeter and a lighted candle to be the most accurate method for determining the amount of deviation from the normal. I would have liked very much to hear from Dr. King what has been his individual experience regarding the causes of paralytic strabismus and I hope in the following discussion that this point will not be forgotten. In my work in this line syphilis has certainly been at the bottom of the paralysis in a large majority of the cases. In every case that I can remember excepting *one*, it has been intracranial syphilis. In the one exception it was probably a gumma of the orbit. I have seen but 3 or 4 cases of paralytic strabismus due to catching cold (the so-called rheumatic)

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but have seen several following injuries upon the head, principally upon the vertex and in the mastoid region. Upon the subject of concomitant strabismus the Doctor has left me nothing to say, unless I strain a point and bring in the subject of paradoxical diplopia, i. e., a *crossed* diplopia, with a *convergent strabismus* and an *homonymous diplopia* with *divergent strabismus.*

This condition I have come across several times and each time I have applied all the tests I could to deceive the patient, thinking it might be malingering. In every case however the answers were correct and consistent so that I am convinced of its genuineness and forced to accept the explanation of the formation of a new macula. May we not hope to hear of the experience of others in the same line?

Dr. Bates: About two months ago I was called to see a case of paralytic strabismus in a man about sixty years of age. About three months previously he had been knocked down by a bicycle, and struck on the left side of his head. Was picked up unconscious and carried to his home; but recovered after a few days so as to be able to attend to business. Two months later was taken with *lagrippe,* and had been confined to the house up to the time I saw him. For some days he had suffered considerable pain in the left orbit, the left eye was turned in, and he was quite dizzy most of the time. A counsel of physicians had decided that there was some brain trouble (I did not learn what) and gave an unfavorable prognosis. I was called in to examine the eye; and concluded that it was the result of the accident (though three months previous) and due to fracture of the apex of petrous portion of temporal bone; with effusion producing pressure upon abducens nerve and Gasserian ganglian. On covering the left eye with a pad the vertigo disappeared. He recovered gradually, and is now attending to business, his eyes being perfectly straight.

Dr. King: I am gratified that Dr. Jessup was able to make such able remarks upon my paper. It is hard to discuss papers which are practically based upon known facts, indeed proven facts—at least many of them for a good many years. As to the suggestion he makes with reference to my experience in paralytic squints, I must confess to have had very little experience. In the few cases I have had, as compared with the concomitant form, the cause has been, in most instances, directly or indirectly traceable to a blow or shock to the cranium, as has been suggested in the case just reported by Dr. Bates. I recall particularly one instance of a young sailor lad in the late war, who fell down a hatchway and injured his head very seriously. From the results of that injury complete blindness has ensued, and he is a pensioner now on account of it. An acute concussion with a scalp wound had been the result of the fall. There was no fracture, and he was sick only a short time. Very soon, however, a strabismus developed, markedly paralytic in character. His history dates back too long for me to have personal knowledge of it, but was handed down by the naval records of that time. I found there was glaucomatous degeneration with corneal degeneration and the man is totally blind. Suggestion of Dr. Jessup

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that syphilis is an important factor in the production of this condition is true. Intra-cranial syphilitic lesions would, when properly located, unquestionably produce these conditions, and frequently do. In fact, other intra-cranial lesions other than specific, are undoubtedly at the bottom of true paralytic squint. The cause must emanate somewhere between the base of the brain and the distribution of the nerves in the ocular muscles.

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THE OPTICAL AND ORTHOPTIC TREATMENT OF STRABISMUS.

By Walter Strong, M.D.,
Philadelphia, Pa.

THE subject of strabismus is certainly a most important one for this society to consider, it being one of the mooted points in ophthalmology. Even a most casual glance over our text-books and journals will serve to verify the truth of this statement, for here we will discover that a wide diversity of opinion exists upon this subject. We will also note that this difference of opinion is not limited to any particular portion of the disease, but embraces strabismus from beginning to end. In fact it appears to the writer to be one of the least understood subjects in the entire domain of ophthalmology.

Under such circumstances it is not at all strange that I should hesitate about accepting the responsibility of presenting to this learned body a paper upon so important a subject as the non-operative treatment of strabismus. But my objections were all brushed aside by our President who informed me that all he desired was my experience with, and views upon the non-operative method of treating this disease.

In this brief paper it is not my intention to occupy your valuable time with any lengthy résumé of this subject. I am not going to burden you with the theories and opinions of others, but rather to give you my own personal experience with the treatment of strabismus. This I do with the sincere hope that my methods may materially differ from those employed by some of the other members present and thus lead to a thorough discussion of this most important subject.

My first awakening to the possibilities and advantages offered by the non-operative methods of treating strabismus occurred about ten years ago while visiting the various European eye clinics. Here I was forcibly impressed with the fact that while they operated less frequently than we at home, they secured results which were superior to ours. So impressed was I with this fact that after further observations I returned home firmly determined to give those methods an impartial trial in my own private and hospital practice.

Having been firmly wedded to the prevailing practice of that period, of operating upon nearly every case of strabismus, I did not take kindly

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to this innovation, I was both skeptical and impatient. But having seen the results in the hands of others I felt certain that the sought for results must be accomplished, and they have been, with results which were satisfactory to both myself and patients. So after a lengthy trial in quite a number of cases I am firmly convinced that we operate far too frequently in strabismus, and that the non-operative treatment has a much wider sphere of usefulness than is usually conceded it.

The most important factor in the successful treatment of strabismus is a careful correction of the refractive error. It has been said that we are all practically agreed upon this question (Priestly Smith in Bowman lecture), but I seriously doubt the correctness of the statement. Many oculists are not even theoretically agreed upon this point, and hundreds absolutely neglect to carry it into their actual daily practice in a thorough and proper manner.

Correcting lenses are only valuable when scrupulously correct, consequently a cycloplegic is absolutely essential in every case. Under the influence of some such agent, preferably atropin, we determine the exact state of the refraction, being especially careful in our examination not to overlook any low defect or slight degree of astigmatism. In young children and in amblyopic eyes this examination is best carried out by means of the ophthalmometer and retinoscopy. As the result of such an examination we prescribe for constant use those lenses which will most thoroughly correct the full refractive error.

In the vast majority of these cases a refractive error is present and in my opinion plays a very important part in the etiology of the disease and unless fully and carefully corrected we cannot expect to successfully reëstablish binocular vision. Unfortunately a great many oculists are content to consider their work finished when these correcting glasses are ordered, and should there be no improvement in the strabismus after a few weeks' trial immediately resort to operative interference, unconscious of the fact that they have not given the non-operative methods a thorough trial.

Correcting lenses having been secured, it is of the utmost importance that they be frequently changed and the adjustment carefully watched, so that the patient may derive the greatest possible benefit from their use. The absolutely proper glasses, applied early enough, will often prevent an operation and permanently cure the squint. By early enough I mean as soon as the squint manifests itself, which in many cases is very early in childhood. In such cases we are met by the objections of the parents, who strenuously oppose us in ordering glasses for such

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young children, but it is in just such cases where we derive the most benefit from a correction of the refractive error. Personally I have upon more than one occasion prescribed glasses in children as young as three years with the best of results and with little or no inconvenience to the child. In fact my experience fully substantiates the statement of Lang and Barrett, that the effect of this treatment is in direct ratio to the youth of the patient. Gould recently reports having employed glasses in children under two years of age, experiencing no trouble and securing most excellent results.

Another very important step in the successful treatment of strabismus is the prolonged use of some cycloplegic, as atropin, dubosia, scopolamin, or any other such agent according to the caprice of the surgeon. This is of the utmost importance in cases of convergent strabismus, here we are enabled to silence the abnormal stimulus to convergence always consequent upon the unconscious but unceasing overaction of the hyperopic ciliary muscle. In such cases I am in the habit of employing a weak solution of atropin (two grains to the ounce) which is instilled into the eyes twice a day, and under the influence of such treatment I have upon more than one occasion seen a permanent cure of the squint brought about. It may be employed with or without correcting lenses, and should always be used in children who are too young for wearing glasses. In divergent strabismus it may also be of benefit, for here a very weak solution might have the effect of stimulating the ciliary muscle and incite the adductors to action, and hence be of service in the early stages.

Under the influence of correcting glasses and the judicious use of some cycloplegic a very large number of our strabismus cases will be very much improved, these cases will usually comprise those cases of convergent strabismus in which there is no amblyopia present. The results in such cases will as a rule be speedily obtained and permanent, resulting in a correction of the deviation and the reëstablishment of binocular vision.

In those cases where amblyopia is present in one eye other methods of treatment will usually be required in connection with the measures just referred to. This naturally brings us to a consideration of the question of amblyopia, a subject which is inseparably connected with strabismus and one upon which there is a wide diversity of opinion.

In nearly all cases of monocular esotropia amblyopia is present in the squinting eye, and opinions differ as to whether the amblyopia is the cause, or result of the strabismus. Much has been written upon

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this question, so much in fact that I hardly think it would be either wise or profitable for us to enter into a discussion of the subject, for we would soon find ourselves involved in a mass of theories upon which we could not possibly agree. Then, too, amblyopia as employed at the present time is a very indefinite and elastic term, simply signifying indifferent or doubtful vision, and unless qualified by an adjective means very little. So that I think we may with propriety omit the theoretical portion of the question and pass on to the more practical one, as to how we may best restore the function of a squinting amblyopic eye.

Perseverance scientifically applied to an amblyopic eye will often be rewarded by a decided improvement in its vision, and frequently result in a correction of the squint. Upon this point I have no doubts, for I have frequently observed it in my own practice, although such a happy result is only secured after persistent and long continued efforts upon the part of the oculist and patient. Our first step in the treatment should consist in an accurate correcting of the refractive error, the full correction being ordered for constant use. Then we instruct the patient to use the poor eye for reading large print for several minutes each day, this being accomplished by the use of a shield or blinder to cover over the good eye, thus gradually bringing the eye into use. Where the occupation of the patient will permit, a most satisfactory method is to instil atropin into the good eye, thus compelling the patient to depend upon the amblyopic eye. Under such a course of treatment there will be a decided improvement in most amblyopic eyes, and with or even before it there will be a marked improvement in the squint. In my experience the use of the blinder in connection with correcting glasses has given most gratifying results and cannot be too highly recommended.

The orthoptic treatment of strabismus deserves more than a passing mention, introduced by Javal in 1871 it received but little attention until quite recently when it was introduced into practical ophthalmology and now promises to take a very prominent part in the educative treatment of strabismus. This method is so well known to all of you that I will not take up your time by a description of it, but simply remind you that it is useless unless the ametropia has been fully corrected. It requires an intelligent patient with considerable perseverance to properly conduct this treatment, but well repays the patient for the trouble.

Prisms may also be employed to advantage in the form of a systematic training of the ocular muscles, a sort of a gymnastic exercising of the muscles which are deficient in their action. Such a course of

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treatment is most conveniently carried out by means of a prism battery as devised by Noyes and Gould, but for home use a simpler and less expensive apparatus is usually desired. In such instances an ordinary trial frame for prismatic lenses and a couple pairs of prisms answer the purpose fairly well. Equipped with such the patient is enabled to carry out exercises according to the oculist's directions, which directions will of necessity vary with the variety of the squint, but usually consist of an attempt upon the part of the patient to overcome the diplopia caused by the prisms in looking at a candle flame held at different distances. Such efforts repeated a couple of times a day will result in strengthening those muscles which are deficient and thus be of much assistance in treating some cases.

Regarding the practice of ordering prisms for constant use much might be said, both for and against. Personally I never order such lenses unless it be to give temporary relief, and look upon them as being palliative rather than curative. Where a prismatic correction is ordered for constant use it is usually found necessary to frequently change the strength of the prisms and each change being to a stronger prism, until finally we reach a point where they become absolutely useless and our patient is in a far worse condition than when we commenced treatment.

In conclusion permit me to say that I fully realize that the methods which I have advocated are not new, but I am also well aware that in this country at least, the non-operative methods of treating strabismus are but seldom employed. I am not narrow minded enough to say that this method of treatment is to be used to the exclusion of operations, but I am firm in the belief that we are often too impatient with our surgery, especially so in the treatment of strabismus.

DISCUSSION.

Dr. F. Park Lewis: As the writer of this excellent and thoughtful paper has truly said there are few ophthalmic subjects about which we have less exact knowledge than of the nature and cause of strabismus. A generation ago, the subject was considered settled when Donders pointed out the relationship existing between hyperopia and ocular convergence; but broader knowledge and more careful study has emphasized the fact that there is still a wide gap to be filled in when we have recognized that convergence and the accommodative effort are mutually co-related.

The studies of Stevens, for example, have shown that muscular imbalance may exist in high degree and yet be not visibly manifested;

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that disparity in strength of the superior ocular muscles may throw out of balance the external or internal recti; and that there may be a wide deviation from the normal in these lateral muscles without there being an ostensible squint; we have learned that the combined action of fourteen muscles inervated from several centers, is an exceedingly complicated process—and that the analysis of any special problem in this class of cases is not determined by any permanent set of factors, but that each case is an individual one and must be studied by itself. It is doubtless within the experience of all of us that the most pronounced instances of eye-strain are not those accompanied by squint but that on the other hand the exclusion of the one eye from active participation in binocular vision is a conservative acknowledgment on the part of the eye that it is unequal to the contest; and the struggle is given up at the expense of a visible deformity—the weaker organ, turning its sensitive and acute point of direct vision to the one side or the other, bringing in the line of direct fixation a less sensitive point and resting the nerve centers by this action. If we are taught anything by these lessons it is that there is at least two distinct elements directly concerned in this process. The effort of accommodation directly affects the coordinate action of the muscles, and the action of the muscles react upon each other.

We will premise another point, in which, I think, all will be agreed. All individuals are not equally affected by an equal amount of eye-strain. In some, peculiarly predisposed, small refractive errors will excite marked nervous disturbances; in others a defect of like kind and degree will be wholly unnoticed and be in no way inimical to normal and comfortable use of the eyes, with complete freedom from the smallest evident sympathetic irritation.

Now especially in those of the first class, indeed in all, if refractive correction is attempted—the focal correction must be exact. Especially provocative of trouble are those forms of astigmatism in which the meridians of least or greatest curvature are not symmetrical or synchronous and in which the cylindrical lenses are of unequal value—or in which together with the cylinder, a spherical lens is required before one eye and not before the other—or if in both of unequal focal values. In other words, in order that the eyes may be made to converge upon the same point—they must be made to have exactly equal foci. This retinoscopy has made possible even in the very young. If this relief be applied at an early age the effect is often surprisingly satisfactory. This is not always however, possible—a corneal scar may occasion an incorrigible amblyopia, and in such case—the difficulty is greatly increased. But assuming that all accommodative strain has been removed, the condition of the extrinsic muscles, must be as carefully analysed; As inequalities of the two sides of the body are not of unfrequent occurrence, as one eyeball is occasionally smaller than the other, it is not unreasonable to believe that in a proportion of cases, be it greater or smaller like disparity in the position of attachment of the ocular muscles may exist and in such when it can be demonstrated no

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measures other than surgical can be expected to give more than temporary relief.

There is, however, yet a third class of cases—and they are by no means uncommon, and to them, I have as yet seen no reference made by any authority—although they constitute in my judgment, one of the most important with which we have to do. In these the defect lies in the co-ordinating nerve centers themselves.

I took occasion, recently to direct attention, to a peculiar conformation of mouth and jaw accompanying lymphoid hypertrophies in the naso-pharynx, obviously a condition of interrupted or perverted development. I have noticed in many cases of convergent squint a coincident imperfection of speech—certain sounds are made with difficulty, or not at all. In some, the sibilants cannot be sounded—in others, the sound of *th* is pronounced as if it were *f* so that "*with*" is enunciated as if it were spelled "*wif.*"

It has been stated that twenty-four muscles are co-ordinated in English speech. In the cases to which I refer there are no physical imperfections which render clear enunciation impossible. This I have tested in individual cases. Stammering is another phase of the same peculiar lack of control over muscles that should smoothly work together or supplementally.

Now while eye-strain may so confound the nerve centers, that they are unable to send out a distinct and discrete afferent impulse, conversely—the confusion may have a cerebral initiative and the brain cells may lack that development that gives them power to co-ordinate muscular activities; and as we discover that some children find difficulty in catching a ball—or walking on a fence—or speaking plain English; so they, or others having a like deficient cerebral development are unable to converge the eyes at will upon a fixed point; to the student of pedagogy this fact has value. The co-ordinated centers are nearly allied in the brain. The association and commissural fibres make it impossible to develop the cells in one point without also influencing favorably those with which they are connected. Training, therefore, valuable as it is in co-ordinating the eye muscles, should be supplemented by making other muscular activities co-ordinate in producing a certain result. Balancing, catching, etc., should supplement prism exercises, and the result will not alone, produce a harmonious action of the muscles of the eyes, but as well—and of even greater importance—that brain balance upon which the whole individual functional activity depends.

As this is a discussion merely and not a paper—this can be only suggestive, for I have already filled my alloted time; but I hope sometime to demonstrate this theory in fuller and more conclusive detail.

Dr. James: I am very glad that Dr. Lewis spoke of that last point. The action of the brain in these cases through the nerve fibres originating from the motor area is not enough appreciated. We do not know that in that way we get certain effects manifesting themselves in these muscles, and unless we can secure medicinal curative action in the motor

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areas we do not cure our case. We may correct the symptoms by the method which he has suggested and which Dr. Strong has recommended; that is, by the systematic training of these muscles—by making a weak muscle gradually increase its power until it comes up in strength to the other muscle, or until it is able to help co-ordinate these muscles into harmonious action in both eyes. The system of training, of course, is left to each individual ophthalmologist. I have found very excellent effects from the Kroll's system of cards. They are now obtained so cheaply, about $2.00 for a set including the apparatus and the cards, that after working with a case for a while and showing them how to use it for a few weeks, I get them to purchase one of these sets. I keep these patients on this training for weeks and months, keeping them reporting to me about once a month, or once in two or three weeks. I have been rather astonished to see how I could train up the weak muscles in some of these cases. There are a good many cases I have examined, where the simple working out of the refraction in its fineness —working out every available point that one can find in the way of astigma, or of hyperopia, or any refractive error, corrected the deviation. One cannot always obtain this on the first examination, and, with a child, if the eye becomes fatigued while under examination, I stop at once and make the patient come back another day. Let them come several times, until you have worked out the case thoroughly in all its refraction defects, and then give them the proper glass. I have seen many of these cases of deviation straighten by this method, but not all, however, will work out this way. One or more of the muscles may be so weakened that you must train it up or else you must give the remedy that will correct the trouble in the motor area in the brain, in order that those nerve fibres which supply those muscles may be stimulated and the muscles balanced.

Dr. Rumsey: I was very much interested in the reading of Dr. Strong's paper.

I usually use prisms, put in a frame, to strengthen the weak muscle by looking at a candle at a distance of twenty feet with the prism-frame one-half minute and then without the frame. There is an alternative contraction and relaxation of the muscle. It is practically a gymnastic exercise. This exercise is prescribed, on the average, twice daily and for ten minutes at each seance. I have thus been able to produce orthophoria in many cases. The remarks made by Dr. Lewis in the training of the centers of the brain are most advisable and very helpful.

Dr. Bissell: If I may be pardoned a word, a point that has greatly impressed me of late is the work along the orthoptic line that we are to do after we have operated. There are cases in which binocular vision is secured after operating. They are more numerous, perhaps, than we have realized. Two cases I specially call to mind, which had the symptoms after marked strabismus was corrected which are apt to follow heretophoria, and which were overcome by the use of Kroil's exercise cards, referred to by Dr. James. I am taking more and more

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pains in trying to develop binocular vision, and some of the amblyopia at times will disappear. We must not be satisfied in dismissing our patients simply because they look better.

Dr. Linnell: In the development of these muscles after an operation there is one point worthy of attention, and that is, electricity. I have recently had an experience in a case of very marked divergent squint following a tenotomy for convergent strabismus some years previously. I made an advancement of the internal rectus with a tenotomy of the external. When I got down to the internal rectus, I found it only about one line in width and attached only by two very small filaments to the sclerotic. I felt rather discouraged at the thought of getting much result from the operation; but under the use of systematic exercises, with prisms and electricity, I have had very gratifying success with the case. The eyes are straight and she has very nearly the normal amount of adduction, overcoming a prism of 40° with the base out before either eye. I think electricity will often be found helpful in such cases where there is a lack of development of the muscle. I used first galvanism for a few days, the negative to muscle and the positive to the forehead.

Dr. Moffat: As for prolonged use of a cycloplegiæ, we must not forget that young children are very susceptible to drugs. We must not forget that the prisms are curative only of the influences that bring the visual axis so close to the macula as to stimulate the desire for single vision. I know that a large number of practitioners will order prisms temporarily to give relief to the patient.

Dr. Deady: In treating strabismus, I always before thinking of operating, fit the case very carefully with glasses under a mydriatic, allowing them to wear glasses for a time to ascertain whether they will be benefited thereby. It frequently happens that for a time the patient will do very well; then the symptoms will recur and the patient return. The first thing to do in a case of that kind is to examine the glasses and see if they are perfectly in line—see if the lenses are exactly as they were ordered. It is of the first importance to know whether the glasses are accurately centered. It is useless to test very carefully for refraction, and give a glass for the full correction of the hyperopia, if the center of the lens fall so far external to the pupil that the patient is looking through a prism with the base outward, exactly defeating what you are trying to do. I have seen a number of cases where the patient was apparently getting worse, where sending them to the optician to have the frames straightened would cause the attack to pass off. In astigmia the axis will be changed by a little bending of the frames, sometimes by exceedingly small amount, which produces a spasmodic effect on the ciliary muscle.

Dr. Walter Strong: I would like to emphasize in conclusion the opinion expressed in the paper that it *is* possible to secure improvement in amblyopic eyes. I am firmly convinced that most excellent results can be obtained with proper treatment, and I have not only repeatedly observed it in my patients, but I have also had some personal ex-

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perience with it. When I started into eye work, some 12 years ago, I was compelled to use the ophthalmoscope almost exclusively with my left eye, my right eye being amblycpic with vision of less than one-third; but with perseverance with an accurate and full correction of the refractive error, together with the use of a blinder over my good eye, I have been able to bring the vision in the right eye up to normal, so that it is just as useful to me as the other. While I have not thoroughly established binocular vision, it is most useful for both distance and close work, when used independently of the other eye. I think that what we want in these cases is an intelligent patient and a great deal of perseverance, such a happy combination coupled with intelligent treatment will secure marked improvement in a large proportion of our cases of amblyopia.

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THE OPERATIVE TREATMENT OF STRABISMUS.

By Harold Wilson, M.D.,

Detroit, Mich.

FOR our present purposes, we shall accept the division of strabismus into two classes, 1, superable, or latent, and 2, insuperable or manifest, and the further division of each of these classes into a, comitant (non-paralytic), b, incomitant (paralytic). Further, three classes of factors are to be considered, 1, anatomical, 2, physiological, 3, mechanical.

Anatomical Factors.—The orbits or bony sockets in which the eyeballs lie, naturally diverge outward and downward, giving to the eyes an average inter-central distance of about 64 mm. If the divergence of the orbits becomes excessive, the distance between the eyes increases also, and unless there is a corresponding increase in the volume and power of the internal recti muscles, the near point of convergence necessarily recedes beyond the normal point, and a condition of convergence-insufficiency results, or, a previously existing convergent squint may be spontaneously cured.

The extrinsic ocular muscles have their fixed origins upon the orbital walls. Variations in the shape and position of these walls may be accompanied by variations in the size and position of the attached muscles. These muscles have their motor insertion upon the eyeball. The place of these insertions is subject to many variations. These variations give rise to many cases of squint, both manifest and latent. They are also important in the performance of operations for squint.

The muscles may be said to have three attachments, 1, fixed; 2, elastic; 3, motor. The fixed attachments are those to the orbital walls, and constitute the so-called "origins." The elastic attachments comprise the connective tissue investments and connections, (capsular insertion). The motor attachments comprise the insertions upon the eyeball, (scleral and capsular insertions). The fixed attachments have no surgical importance, but it is far otherwise with the elastic and motor connections. An accurate knowledge of these is essential to the proper conduct of operative measures. Time will here permit no more than a brief reference to their anatomical relations.

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The motor attachments of the muscles consist of their *direct* connections with the globe by means of their tendinous extremities, (all the recti, and the superior oblique), or muscle fibres themselves (inferior oblique) and of their *indirect* connections with the globe by means of various fascial extensions. From the fact of this double connection it follows that either the fascial or tendinous insertion may be severed without destroying the motor action of the muscle to which they belong. Also, that the tendon being divided and a certain impairment of the motor function being secured, this may be increased by the further division of the fascial extensions from the muscle to the globe.

Or, a certain effect may be secured by the division of the fascial attachments alone. (Parinaud.)

The aponeurotic or capsular investments of the muscles have been described with complicated minuteness by various authors. The following description is rather simple, and, I think, not difficult to understand.

All of the structures within the orbit are invested with connective tissue sheaths, which are mutually connected. At about the level of the equator of the globe, these sheaths thicken, particularly those of the muscles, and extend away from the eyeball toward the orbital walls, to which they are attached, forming a wall or septum supporting the globe, and dividing the orbit into two parts, an interior and posterior. This wall is sometimes called the "orbital septum," and those portions lying over and about the muscles are so much more developed than the inter-muscular portions, even containing muscular fibres, that they have received special names, "tendon of Tenon," "orbital muscle of Sappey," "check ligaments." These constitute what I have called the elastic attachments, and their function is to support the structures of the globe and to moderate muscular action.

Anterior to this septum, these sheaths descend upon the eyeball and muscles, forming the "anterior capsule." It is the connections of this capsule with the muscles and adjacent tissues which is of the greatest surgical importance. The external face of the muscles lie under the capsule more or less naked and free from adhesions. At the borders of the muscles, however, two sets of adhesions are to be noted: first, what are called "pre-muscular." These fibres extend from one border of the muscle to the other, arching over its external face, and forming there a small serous cavity, called the "pre-muscular serous cavity." Second, from each border of the muscle fibres extend laterally to join the inter-muscular portions of the anterior capsule, and to be inserted upon the

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sclera in the space between the insertions of the muscle tendons. These are called the "lateral adhesions" (Boucheron). The inferior face of the muscles is usually free.

Physiological Factors.—The first physiological factor to be noticed is the fact that the movements of the eyes are regulated by certain binocular innervations. There are twelve primary associated movements of the eyes as follows:

1, Both eyes to the right—dextroversion,
2, Both eyes to the left—lævoversion,
3, Both eyes upward,—sursumversion,
4, Both eyes downward,—deorsumversion,
5, Both eyes outward,—divergence,
6, Both eyes inward,—convergence,
7, Right eye up, left eye down—right sursumvergence,
8, Left eye up, right eye down,—left sursumvergence,
9, Torsion of both eyes to the right,—dextrotorsion,
10, Torsion of both eyes to the left,—lævotorsion,
11, Torsion of both eyes outward,—distorsion,
12, Torsion of both eyes inward,—contorsion.

Whether the impulse for each of these movements originates in its own special center is not yet known. Those for convergence, sursum-deorsum-, dextro- and lævo-version are generally admitted and recognized while the existence of a divergence innervation is admitted by some and denied by others. It is quite possible that each one of these associated primary movements has its own innervational center.

The convergence innervation is most intimately connected with that of accommodation, and hence with refractive conditions, so that optical considerations become of great importance in the treatment of many cases of strabismus.

The movements of the eyes are conditioned by four (or more) physiological laws, which may be called 1, The Law of Definite Concert; 2, The Law of Identical Sensation; 3, The Law of Identical Position, and 4, The Law of Least Effort.

The law of definite concert is illustrated in the various innervations referred to above. Two simultaneous impressions of a single object must be harmonious in order to give the (mental) impression of singleness. The two eyes together should act as one. It is as if the nervous innervational impulse started from one point, traveled along one path to a certain other point and there divided, part of it going to one eye, part

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to the other. Thus under the influence of the dextroversional impulse both eyes turn to the right with perfect harmony .

The law of identical sensation. Identical visual relations between the visual subject and the object, whenever occurring, give rise to identical visual sensations, and conversely, identical visual sensations, whenever occurring, determine identical visual relations between the visual subject and object.

The repetition of identical visual sensations determines the visual recognition of external objects. The complex and varying relations between the visual subject and object are, perhaps, never identically repeated in every particular, but certain essential or grosser relations often recur. Thus we come to know the features of a landscape as familiar, and to recognize the features of our friends.

I believe that the laws of visual projection are in part, to be deduced from this law.

The law of identical position, (Donder's Law). This is a consequence of the converse of the preceding law. For any definitely fixed (identical) relation of the visual fixation line and the head (body, position of observer, etc.), the torsion of the eyeball, (or more generally, its position in space), must be fixed, (identical). Otherwise, varying visual relations between the visual subject and object would give rise to identical visual sensations, contrary to the law of identical sensation.

The law of least effort, (Listing's Law). Although Listing's law was originally enunciated as a law of mechanical equivalents merely, it seems capable of a wider application as a physiological law. At least, the facts of ocular movement to which it applies are related by a general law, and although this law has not yet been stated, it might be tentatively formulated as follows: In passing from one position to another, the eyeball seeks to traverse the path of least effort.

Motor Functions.—We must recognize three states of the motor functions: 1, over-action; 2, under-action; 3, irregular action. (Duane.) Each of these may be 1, structural; 2, innervational.

Thus, an inward deviation of the eyeball may be due to

1. Structural (Anatomical) { over-action of adductors or underaction of abductors.

2. Innervational (Physiological) { over-action of adductors (convergence) or under-action of abductors, (divergence).

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3. Combined structural and innervational causes.

Mechanical Factors.—The motion of a mobile body under the influence of several forces applied to it, is the resultant sum of the combined action of those forces.

In the eye we have forces called "tractions," of two kinds: 1, muscular tractions; 2, resistant or elastic tractions. These may result in 1, translations; 2, rotations; 3, twists. Translations are linear displacements of the eye as a whole. They exist only to a slight extent, (en- and ex-ophthalmos) and may here be disregarded. For similar reasons, twists, which are combinations of rotations and translations need no attention in this connection. The movements of the eyeball to which attention will be limited are then

Rotations. These are the result of several simultaneous pulls tending to spin the eyeball, each in a different direction, and in general, to a different degree. Our knowledge of these several forces is still imperfect, so that we are able to establish the dynamics of the eye with only approximate accuracy.

Rotations of the eyeball occur about an imaginary axis or line passing through a certain point within the globe called the center of motion, and situated about 13.5 mm. behind the summit of the cornea. This point is supposed to remain the same for all movements of which the eyeball is capable.

The axes of rotation for the several muscles of the eye have been determined by a number of observers with approximate agreement. These observations suppose that each muscle is free to act upon the globe without restraint, although practically, the movement of the globe when a single muscle contracts is the resultant of the pull of the muscle plus the pull of the various resistances, elastic and otherwise, so that the axis of rotation of any single muscle cannot really be determined until the amounts and directions of the resistance pulls are known.

In the normal activity of the eye, its movements, in general, cannot be effected by the contraction of any one muscle acting alone. There are several reasons for this statement.

1. The position of the several muscular axes, so far as known, is such that in general, the rotation of the globe about these axes would bring the corneal meridians into positions inconsistent with the law of Listing.

During the contraction of any muscle having an antagonist, this antagonist is usually innervated so as to act as a means of controlling

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the extent and rapidity of the resulting movement. Thus, if we assume a contraction of the external rectus muscle, a corresponding contraction of the internal rectus is necessary to regulate and check the outward movement of the globe, and to permit the line of fixation to be carried to any particular point desired. That we have the power of directing the gaze very accurately in any direction, with various rates of speed and to any desired point, is a matter of universal and constant experience. The existence of a regulating mechanism is therefore evident.

In general then, all rotations of the eyeball are the result of the simultaneous contraction of several muscles, together with the tractions of the several associated elastic tissues.

The extent and direction of the resultant rotation in any case is dependent upon 1, the place of origin and insertion of the muscles relative to the co-ordinate axes of the globe; 2, the size and strength of the muscles; 3, the direction and amount of the associated elastic tensions; 4, the degree and amount of the muscular contractions (innervations); 5, the nature of the visual act performed, *e. g.*, whether in parallel or convergent binocular vision; rotation from the primary to a secondary position, or from one secondary position to another.

Mechanics of Strabismus.—The essential objective feature of strabismus is the fact that the visual lines do not meet at the point of fixation.

Suppose we have a case of convergent squint of the right eye of 4 mm. If the globe is 24 mm. in diameter, this is equal to about 19° of angular deviation. According to the measurements of Volkmann, the eye being in the primary position, the following averages obtain;

	Insertion from cornea.	Total length of muscle.	Length in contact with globe.
Rectus internus.....	6 mm.	40 mm.	7 mm.
Rectus externus.....	7 mm.	49 mm.	13 mm.

Now, if a convergent squint of 4 mm. exists, the above relations are altered as follows:

	Insertion from cornea.	Total length of muscle.	Length in contact with globe.
Rectus internus.....	6 mm.	36 mm.	3 mm.
Rectus externus.....	7 mm.	53 mm.	17 mm.

Now suppose that in such a case of squint the tendon of the rectus internus muscle be divided so as to produce a wound which gapes in a horizontal direction 4 mm. The equilibrium of the eye being dis-

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turbed, two important mechanical changes occur: the divided muscle being opposed by a reduced traction, retracts, or tends to retract until its elastic tension is again opposed by equal and opposite counter-tractions, and the elastic tension of the external rectus muscle and the other counter-tractions being opposed by a diminished resistance, by contracting (elastic) rotates or tends to rotate the eyeball outward. The 4 mm. of wound space represent the limit of the sum of these two movements. If the elastic pulls outward and inward are equal, then the former rotate the eyeball outward 2 mm, and the latter draw back the posterior border of the wound by the same distance. In other words, the correction of the squint produced by a wound 4 mm. in extent, the outward and inward elastic tractions being equal, is just half this amount, and to obtain a full correction, the other conditions remaining the same, the wound would have to gape 8 mm.

If on the other hand the elastic pull of the internal rectus muscle were greater or less than that of the externus, the corrective rotation of the eyeball following the operation would be correspondingly more or less than half the gaping of the wound. Practically we find, I think, that these differences in elastic tension do exist, so that the amount of correction following a given operation is not always the same; a moderately gaping wound producing greater correction in some cases than in others.

Similar considerations obtain in operations advancing a muscle or Tenon's capsule, the amount of correction secured depending not only upon the amount of advancement (that is, not only upon the point at which the sutures are introduced, or the amount of muscle or tendon exsected) but also upon the relative elastic tension of the opposing muscles and fascia.

If, in such a case of strabismus as we have supposed, the rectus internus has a maximum power of contracting 15 mm., its length would then be 36—15=21 mm. We may further suppose that with a tenotomy producing a wound 6 mm. in extent, the retraction of the divided muscle equals 2 mm., and the corrective rotation of the eyeball equals 4 mm. The internus now measures 36—2=34 mm., the externus 54—6=49 mm. If now, there had been no change in the resistant tension of the capsule (check ligament) of the internus muscle, or of the outward elastic tractions, they would equal the retractive tension of the muscle when this had reached a length of 21 mm., but 21=34—13 mm. Thus 13 mm. would represent the extent of the adduction after the operation, or in other words, the adduction would be reduced

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by just the amount of retraction of the divided muscle. But when the internus had reached a length of 21 mm. the eyeball would be 4 mm. less in adduction than before the operation, and the outward traction of the externus and the elastic tissues would be just so much less tense, opposing so much less resistance to the inward rotation of the globe, and permitting so much more contraction to the internus, providing that the check ligament had not already reached the limit of its extension. Hence the amount of adduction remaining after the operation would actually be somewhat in excess of 13 mm., though less than 15 mm. If there were no corrective rotation of the globe following the tenotomy, the entire gaping of the wound would be produced by the retraction of the divided muscle and the adduction would be reduced by this whole amount.

In advancement, the elastic capsular tension opposing the muscular tension is increased somewhat, but the contractile power of the muscle is also increased, and in proportion to its length, so that generally, there is an increased power of duction on the part both of the advanced muscle and of its antagonist. In some instances however, what is gained by the advanced muscle is lost by its antagonist.

Previous to operating for strabismus, the following facts should be noted in the record of the case:

1. Age of patient.
2. History of the case.
3. Nature and amount of the deviation, expressed in millimeters or in degrees of angular deviation, for the nine principal areas of the motor field.
4. The power of abduction, adduction, sursumduction, deorsumduction, convergence and divergence.
5. The visual acuity and refraction.
6. The nature and extent of the double vision that can be elicited by means of prisms or colored glasses.

Indications for Operation.—In children, orthoptic methods of treatment and the use of atropine or glasses in appropriate cases are to be preferred to operative measures. Some forms of squint have a tendency toward spontaneous cure, and the most conservative surgeons prefer to wait until the patient has reached puberty before resorting to its surgical cure. However, since the cure of strabismus by orthoptic methods is, in any event, a prolonged, tedious and more or less expensive matter, it will be rejected by many parents as either impracticable or impossible, and an operation may become desirable at an earlier age. Almost

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never, however, should a radical operation be advised in patients under seven years of age. In appropriate cases, particularly where some form of orthoptic training can be undertaken, a partial correction of the squint may be undertaken at an early age.

Any operation for the relief of strabismus can be very much better performed under cocaine anæsthesia, and a more satisfactory result secured than where a general anæsthetic is given. This is an additional reason for delaying the operation until the child has reached a manageable age.

A simple tenotomy of the rectus internus muscle with the division of the lateral and pre-muscular capsular attachments, will give a maximum correction of about 4 mm. (19°-20°). The same for the rectus externus muscle will give a maximum correction of about 2 mm. (9°-10°). When the correction after tenotomy is insufficient, if the corresponding duction of the two eyes is about the same, the corresponding muscle of the other eye may be divided, if sufficient effect may be secured thereby. If the duction of the squinting muscle is restricted, its opponent should be advanced. Where the effect of a tenotomy is too great, it should be reduced by a suture involving the conjunctiva, subconjunctival tissues or muscle, more or less, depending upon the amount of reduction desired. In alternating squint, the operation should be divided between the two eyes.

Where the retraction of the divided muscle is great, the correction will be small. It may result in getting no corrective effect at all. In such cases, a temporary external suture or guy, producing a forcible rotation of the globe into position, may be employed. (Knapp.) Where the squinting eye is amblyopic, and the tenotomy fails of effect, it may be combined with muscular or capsular advancement of the antagonistic muscle of the same eye. If the vision of the two eyes is equal, or approximately so, and if following the operation, orthoptic treatment is to be given, it is necessary so to regulate the operation that the duction of the two eyes in various directions (abduction, adduction, sursumduction deorsumduction) is maintained, or made as nearly equal as possible, *e. g.*, right and left adduction should be equal. Where the squint is compound, that is, where the eye deviates out of the primary vertical or horizontal plane, (*e. g.*, hyper-esotropia), in general, two series of operations are necessary: 1, to correct the vertical deviation; 2, to correct the horizontal deviation. In some cases of latent squint particularly, the correction of the vertical deviation is all that is necessary, the horizontal deviation spontaneously disappearing after the first operation.

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In divergent squint, the combined tenotomy of the rectus externus muscle and advancement of the internus of the same eye is usually necessary. Sometimes the advancement alone suffices. The primary correction should exceed that eventually desired, and in ordinary cases, there is little or no danger of making a permanent over-correction.

The nature of the operation to be undertaken in any case of squint is determined by the nature and cause of the squint itself, the power of duction or version in various directions, the power of convergence and divergence, the anatomical peculiarities of the special case, the extent of vision and the purpose for which the operation is undertaken.

The complete purpose of the operation for squint is:

1. To correct the deformity as entirely as possible.

2. To secure a proper equilibrium in the static and dynamic actions of the ocular muscles

3. To render possible in suitable cases, by subsequent training, the acquirement of binocular vision.

These points are stated in the order of their practical importance. The most notable consideration is to correct the deformity. This result although it realizes only part of the purposes of the operation, will be all that can be done for many patients, and all that is desired by others. The second consideration above noted, is important first, to obtain a correction of the squint over the entire motor field if possible; second, to render the subsequent acquirement of binocular vision most likely.

Results of the Operation for Squint.—In the majority of cases of squint, the immediate results of surgical treatment are satisfactory, that is to say, the squint is removed, either wholly or in part. The remote effects are not always so satisfactory, a squint which has been removed for years, sometimes returning, or being followed by a squint of the opposite sort. Statistics or detailed reports to show the ultimate results of these operations are scanty. The following statements are generally admitted:

1. After tenotony of the rectus internus muscle, the effect may diminish slightly for a few days, and then increase for an indefinite period of years, even to the extent of producing an opposite squint.

2. After tenotomy of the other recti muscles, the effect may increase for a few days and then slowly diminish. This is particularly true after tenotomy of the rectus externus.

3. The effect of advancements usually diminishes for an indefinite period.

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In respect to these changes there are no fixed rules, great differences existing in different cases.

Some cases of squint appear to be incorrigible, though it is not possible to predicate the fact in advance. I believe as we progress in the knowledge of ocular movements and all that these imply, we shall be better able to effect a cure in all cases. Thus, the effect and treatment of torsional defects are at present imperfectly understood, but their influence in the production or maintenance of squint seems undeniable.

In general, an over-acting muscle should be tenotomized, and an under-acting muscle advanced. The following table represents the commonly appropriate procedures in affections of the various separate muscles, and although it is not to be taken as absolute or invariable, it may properly be adhered to in most cases:

Explanations—The letter A in the table means advancement; T, tenotomy. Without brackets they are to be taken as expressing the commonly necessary operation; enclosed in brackets, they refer to operations which *may* be required, or may be omitted as the circumstances of the special case may indicate. The table is largely compiled from Duane, *Motor Anomalies of the Eye.*

Motor Anomalies of the Eye.

Muscle or Function.	OPERATION ON			
	Affected Muscle	Corresponding Muscle of Other Eye	Antagonist of Same Eye	Associated Antagonist of Other Eye
Rectus Internus—				
Under-action	A		T	T
Over-action	T			
Rectus Externus—				
Under-action	(A)		(T)	T
Over-action	T			
Rectus Superior—				
Under-action	A	(T)	(T)	
Over-action	T			
Rectus Inferior—				
Under-action	A		(T)	
Over-action	T			
Obliquus Superior—				
Under-action				T
Over-action			(T)	A
Obliquus Inferior—				
Under-action				T
Over-action			(T)	A
Convergence—				
Under-action	A	A	(T)	(T)
Over-action	T	T		
Divergence—				
Under-action	A	A	(T)	(T)
Over-action	T	T		

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In convergence deficiency, where an operation becomes necessary, both interni should be advanced: If divergence excess is also present, the external recti may be divided, and conversely. Convergence excess may require tenotomy of the interni, and if divergence insufficiency is present, advancement of the externi also. Divergence deficiency and divergence excess are to be similarly treated.

Methods of Operating.—There are numerous methods and variations in methods of operating, the discussion of which, space will not now permit. It is of much less importance however, in what precise manner the conjunctiva is divided, the tendon severed or sutures introduced, than that the proper species of operation be selected, and performed with a due knowledge and appreciation of the complex anatomical and physiological factors which enter into the problem which the operation attempts to solve

DISCUSSION.

Dr. Boynton: The subject of strabismus has excited more comment, the operations for its correction have been followed by more disappointments, probably, than any other branch of our special surgery. Nature's wise provision of the sensorium objecting to double images, provides for the suspension or suppression of one image. Were this not true, the regrets and failures, the monuments that would be put up to our incompetency would soon drive us out of the profession. Happily we cannot, in the majority of cases, re-establish binocular fusion.

According to the methods of operation in practice when I began the study of the eye, nearly every muscle operated was followed by insufficiency; but it did not make much difference to the patient, because all such operations are undertaken for cosmetic effect, and if there was an insufficiency of one muscle, they soon learned to rotate the head and adjust the eyes so that the defect was not seen. They looked better, and it was only when more definite methods of measuring the individual strength of the muscles and their relative balance were devised, that we realized our incompetency. We are astonished at the old instruments when they are compared with our modern appliances. When we see the big Plunkett scissors used twenty-five or less years ago, the big hooks that were introduced under the tendons and the recklessness with which adhesions between the globe and Tenon's capsule and the other investing membranes of the orbit were torn, we are not surprised at the insufficiencies that resulted. We have industriously tried to educate our conception of our eyes and to acquire a delicate touch. We are excluded from considering insufficiencies other than those manifest in this discussion, and have no right to go into

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the field of heterophoria; but the field of strabismus overlaps the field of phoria where alternating strabismus exists.

Orthoptic exercises, ocular gymnastics, development of muscles through ordinary appliances, in the interest of producing binocular vision, may be compared to making a whistle out of a pig's tail. Life is too short and the result too unsatisfactory to adopt such treatments as a whole. I have rarely seen a case where binocular vision was produced, and that is a good thing. Every case of strabismus is better for amblyopic vision. The attempts at correction by operative interference fail to produce binocular fusion, and it is happily so; because those cases where binocular vision is obtained in alternating strabismus, and the visual lines are made approximately parallel, cause the most trouble. Strabismus cases do not suffer except in the beginning of the trouble and then when they attempt to use the eyes at the near point. Then reflex disturbances like vomiting, nausea, cold sweats, confusion, enuresis occur. All or any of these symptoms come to the little children who are just learning to suppress the vision of one eye, but after they have accomplished that they do not suffer. It is the cases where the visual lines are approximately parallel that have trouble and hence comes the danger of parallelism.

All these faults are congenital or acquired. Congenital faults we must confess, are anatomical differences in length. Now whether the case is wide between the eyes, has large eyeballs, small eyeballs, short interni, or short externi and correspondingly long antagonists does not matter. They are anatomical faults, and all the results of heredity. They are all evidences of degeneration. They occur in the higher classes, the more highly educated, the wealthier people the more they degenerate. In the lower classes it is due to other causes, like intermarriage, excessive diet, stimulants, poor environments and improper opportunities for development.

After having gone through all the orthoptic exercises recommended you will still almost always have the strabismus. A few cases will be corrected by correcting the axial faults or the faults of curvature in the eyeball, but they are few in my experience, and we must resort to surgical interference. Shall we hack off the muscle with the old fashioned scissors, the big hook, and tear off all the adhesions between the tendon and the eyeball, and between the check ligaments, between the sub-conjunctival tissues and the conjunctiva, and loosen the conjunctiva up to the fornix so as to get a depression over the insertion of the muscle? This method has been an invariable failure. All have left it in disgust and gone to optic appliances and orthoptic exercises. I have had many failures; but I have earnestly tried to educate my hand, to get some ideas into my brain, and to school my eye to comprehend and to appreciate as well as my hands to correct, and I believe the only way to correct a short tendon; viz., to make it approximately of the length of its antagonist, is to set it back. But we may cut off the whole tendon and get no correction. Those cases in which the operators carelessly sweep the big hooks around with a horizontal or

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a vertical movement, it does not matter which, so that it is away around the insertion of the tendon which is all hacked off obliquely (always obliquely as cannot be done any other way), have the check ligaments about the muscles destroyed. These expansions of Tenon's capsule, which are sometimes called the tendinous muscle, go to the borders of the septi dividing the orbit into anterior and posterior portions and restrains the muscular action. As a rule they hold back on the muscle; but sometimes they hold forward. All these adhesions between the tendon and the eyeball are elastic, and aid in motility of the eyeball. I would try to save all these adhesions possible and to do so I would make a little buttonhole in the conjunctiva if I were operating the internal rectus about 6 millimetres from the cornea although no two cases are alike. I would just cut a little buttonhole in the centre of the tendon. When the eye is strongly rotated outward your buttonhole will gape and in that depression with your fine forceps you can pick up the middle of the internal rectus right close to the insertion by guiding the forceps back and forth. If you have cut a little too far back or a little too far forward, you can find where the tendon takes up fat freely, and then incise just in front of it, make a buttonhole in it. Now you are in command of the situation. You have not disturbed any adhesions, above, below, outside, or anywhere around the tendon; and then you may snip up or down till you get what you think you want. This applies more to phoria than to strabismus, but in the latter you have to go right on and cut off all the tendon, which you will soon learn to locate. Then you incise the capsule till you have cut as much as is advisable and still you may only have half the correction. Then you measure the rotation of the eyeball, supposing that you have done so before operating as well as having measured the strength of the individual muscles. If you still have too little movement, incise the check ligaments carefully, so you may not lose the motility of the muscle and produce insufficiency. When you have done half of the correction on one eye, which you can easily do in this way, you will get increased abduction and have sufficient adduction remaining. If the effect is not sufficient, then do it in the other eye, which should be done in all cases, so as to divide the operation between the two eyes, in order to get proper rotation.

Dr. Suffa: I have listened with a great deal of pleasure to Dr. Boynton's lurid description of graduated tenotomy, but cannot agree with his opinion of their efficacy, and I would like the opinion of others in regard to this matter. I have met with invariable failure when following the operation according to Dr. Stevens' method, even in moderate degrees of heterophoria, and consequently have modified the operation by separating the conjunctiva slightly beyond the edges of the muscle, according to the amount of displacement desired. Then I buttonhole the muscle and introduce the small hook, and cut both halves of the muscle. Even with this liberal cutting, I have often found it necessary to separate lateral attachments. In these operations it has always been my intention to remove fully one-half of the devia-

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tion from the squinting eye, and the balance from the other eye. I am not always successful, usually under correcting, even with their free division according to graduate tenotomists. I pursue this same method in heterophoria, but to a more limited degree.

Dr. Phillips: There is a theoretical and a practical side to these questions. I apprehend that the reason why failure has been so frequently experienced among oculists in this operation is because we have been unable often to accomplish two things; viz., (1) To get binocular vision: (2) To get, even approximately, perfect optical correction. We know very well that in cases of amblyopia of one eye, that it is often the case that the patient will see with the best eye and pay no attention at all to what is seen with the other eye, whether it is standing straight or is standing diverted one way or the other, or whether the deviation is corrected by a prism. You cover the eye that he is seeing with, and he will see nothing at all with the other eye until something attracts his attention and he finds out that the best eye has been stealthily covered. The first and the most important point, then, is to induce a disposition to use the eyes together. If that can be brought about, we find that the matter of an operation is far more satisfactory. The second thing is, to get as perfect correction as possible of whatever error of refraction may be present. If there is a disposition to use both eyes together, by any sort of practice whatever, and approximately perfect correction of the error of refraction is made, the operation will be satisfactory.

Dr. T. F. Allen: It has been a surprise to some of the gentlemen to meet me here; but I came on purpose to attend this meeting, and almost purposely to listen to this discussion. Since I was an ophthalmologist, I have become a general practitioner, and I am obliged, with the recent progress of the science and art of ophthalmology, to give up all my special work, and largely advise on such matters with you specialists. I want to say just here, that I have been exceedingly gratified and was last evening at the manly stand each of you gentlemen took, especially Dr. Hooker, who took the bull by the horns and disclaimed any reliance on or intimacy with homœopathy. That is the right position for you gentlemen to take *as specialists*. I am speaking from the standpoint of the general practitioner altogether. I came here to learn how I should give advice to patients whom I recommend to oculists and who come back to see me and say "The oculist advises me to have my muscles cut, what shall I do? Shall I have my muscles cut, or not?" I want information on that subject, and all general practitioners want this information. You do not know how widespread the interest in this subject is. The ignorance is very widespread, and the inability to give proper advice to our patients on this subject is very general. We do not know what to do. A member of one of my families recently went to a celebrated oculist in New York, who said, "You want your eye muscles cut." It was cut. It was cut again. Then the opposite muscle was cut. The upshot was that almost every rotating muscle in the eyes was cut. Then advancements were made of first one, then the other until advancements of nearly all the muscles had

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been made. That young man has had his health almost completely ruined by these successive operations, his prospects in life have been greatly injured, perhaps impaired beyond recovery. It is a very sad case. The advice to cut was bad; the advice to advance was bad; the whole business was bad. And we practitioners have become afraid of you gentlemen advising to cut muscles, until we are apt to say, "Damn the oculist!" I tell you, this sentiment is very general and widespread. There is a great deal of careless advice given to cut. I have learned something here this morning. I was very glad that this paper was first read, which advised a more careful examination of the visual acuteness of the eyes. The correction of these visual amblyopias and attention to the cerebral conditions of the patients suffering from adenoids and the general symptoms which the patients suffer from who have these adenoids and defects of speech, etc., have a bearing upon the eyes. I fancy you will have to pay a great deal of attention to this. I am frequently asked by patients, "Doctor, the oculist says I must have my muscles cut: what shall I do? I am afraid of him." And they say farther that "Mr. So and So's son or daughter had their muscles cut and were worse than before, constantly getting worse and worse. Now the oculist says I must have my muscles cut. What shall I do?" There is great danger of the oculists losing their hold upon the profession by this indiscriminate advice "to cut the muscles." I know perfectly well that it is advisable in many cases to give such advice, but it is a very serious matter I assure you. In my opinion this is a most serious aspect of these cases, and I hope it will be discussed fully and frankly to some purpose. It is needed by the whole profession. I wish evey one could hear the whole discussion and profit by it.

Dr Rumsey: I do not know of any subject over which I have burned the midnight oil as the study of the muscles of the eye.

First of all, I secure the refractive error of both eyes and then I secure the muscular strength of each muscle of the eyes and note their relationship. In securing the refractive error, I am particular to acquire the exact angle for the axis of the cylindrical glass. There is no machine or organ that can lose its balance so easily as the muscles of the eye. Small deviations may produce severe pain.

Where the phorometer shows esophoria in the far and near tests and an adduction of 40° or more, it is advised to give a full correction of the hypermetropia, thus curing the pseudo-esophoria. What remains may be cured by a tenotomy. Should the adduction be below 40°, prismatic exercises should be given. And where the low adduction is associated with low abduction, I strongly advise against tenotomy. Develop both the internal and external recti muscles by carefully prescribed exercises.

Where the phorometer shows exophoria in both the far and near test with an abduction of more than 8°, partial tenotomy of the external recti should be performed. Where the abduction is less than 8°, prescribe exercise. Where the abduction is 8°, I advised against operating

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on the external recti muscles, but these prismatic exercises to develop the internal recti muscles and let the advancement of this muscle be the *dernier resort.*

I have known of cases where a tenotomy was performed to make either a normal or weak muscle equal its weaker opponent.

I always advise conservatism in the treatment of strabismus.

Dr. Norton: The remarks of Drs. Phillips, Allen and Rumsey, I wish to most heartily endorse. I am glad to see that within the last few years more and more of our leading oculists are abandoning the promiscuous cutting of the ocular muscles. I have been on record since the first edition of the "Ophthalmic Diseases and Therapeutics," in '92, and in fact a number of years before that, as in opposition to the too general cutting of the muscles of the eye. I fully recognize the advisability and even the necessity of operative measures in a certain few cases.

I regret that through the craze of some men to cut the eye muscles for every ill that flesh is heir to, we have to listen to such words of wisdom and advice from the general practitioner as Dr. Allen has spoken this morning. It is certainly a grave reflection on our specialty when the general practitioner is unable, from sad experiences, to recommend his patients to follow the advice of the oculist. The time for operation in heterophoria should, in my opinion, be *only after all other methods* of cure had been thoroughly carried out.

My records show that I can find some form of muscular disturbance in over 90 per cent. of all cases that consult me for their eyes. I do not believe that the human race are as a rule created with abnormal ocular muscles in order that the oculist may correct the same. In my judgment, the cause of heterophoria is oftentimes due primarily, as Dr. Phillips has said, to uncorrected refractive errors. Another important cause is undoubtedly the over and improper use of the eyes. By improper use of the eyes I mean, use by poor light, while convalescing from illness, while in improper positions, etc., etc.

The operation of weakening a stronger muscle to cure heterophoria does not seem to me either rational or physiological. I believe our aim should always be to first strengthen the weaker muscle, by prism, exercise, etc., in every case possible—failing to restore the balance in this way, we may next try to relieve by allowing the patient to wear prisms partially or wholly correcting the trouble. As a last resort after these methods have failed we may turn to operative measures.

Dr. Bates: I believe that when we can get binocular vision without putting strain upon the eyes, it is all right, and we are doing a good thing. If in getting that binocular vision we have got to change a case of strabismus into a case of heterophoria, I believe we are doing more harm than good; that is, if there is anything in the theory that my paper advocates.

Dr. Moffat: I agree emphatically about the necessity of establishing binocular vision first if we hope for a permanent cure; it seems to me

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an argument for early operation in children. I would like to hear the judgment of those present about the ages at which it is wisest to operate. The writer would never operate under seven years old; I have heard others fix the age at eleven. I also hoped to hear about graduated tenotomies; these do not seem to be practiced as much as they were. There is another operation for squint that has not been spoken of; I have relieved squint by circumcision, and always examine the prepuce of every boy brought to me with squint.

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THE USE AND ABUSE OF THE ELECTRO-CAUTERY IN NOSE AND THROAT WORK.

By Irving Townsend, M.D.,
New York.

DURING the past five or six years, my use of the electro-cautery has gradually diminished, and given place to what I believe to be more discriminating and successful methods. This has not been a conscious effort to make practice accord with preconceived theory, but rather a process of evolution, by which each new operation or remedy finally reaches its proper sphere of usefulness. There is no question that the electro-cautery is a very efficient instrument for certain kinds of work in the nose and throat, and it is equally certain that its injudicious use in unskilled hands is producing disastrous results. More than ten years ago the most *dire effects* were predicted from cauterization, by one branch of the profession, while the other, (including most of the specialists) enthusiastically advocated it. While each gave an exaggerated idea, both were in error, although it is due to the former to state, that their criticisms have been justified too often, by the subsequent history of the patient and apparent ill-effects from this treatment.

This is not surprising, when we consider the fact that the preceding fifteen years had been the experimental stages, inaugurating the use of cocaine and the electro-cautery and giving an impetus to the work, which carried it much further than was safe, or expedient.

This easy and painless method of restoring nasal breathing was employed extensively, by specialists as well as by others, with varying degrees of success. As time has progressed and our clinical knowledge increased, we are learning to lose our dread of the "ancient bugaboo," *scar tissue,* and to know that in the right place it is a beneficent thing.

I will endeavor to formulate briefly some general rules, which I trust will be of service to some one when undecided what particular plan of treatment to adopt in a given case. From the statements made by some writers, and what I have observed, to be a common practice, it is quite evident that the electro-cautery is regarded by many as the best method of relieving most of the impediments to nasal breathing. I do not think that this view obtains, to any large degree, among rhinolo-

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gists, most of whom are probably in accord with the sentiment of the article.

The following are a few of the conditions, in which the use of caustics and electricity, is not simply *useless* but *injurious* and even *dangerous,* and with the few exceptions noted, should NEVER be employed, viz.—

I. On the septum narium (except to stop bleeding or destroy a vascular growth).

II. In reducing growths of a bony or cartilaginous nature.

III. In atrophic rhinitis.

IV. In destroying synechiæ.

The process of repair in cartilage, (being due to a proliferation of pre-existing cells, instead of exudation) is, much retarded by the inflammatory effects of thermo-caustic applications.

This intolerance to heat is shown by the difficulty in getting these wounds healed, and covered with a healthy membrane.

Perforation of the triangular cartilage is a common result and synechiæ often follow the careless use of the cautery.

This argument would be unnecessary but for the fact that there are still rhinologists of experience who burn the septum with impunity, and justify themselves by clinical reports of a satisfactory character, but which are not in accord with the common experience of others.

Of the many cases of various forms of nose and throat disease, treated by the electro-cautery I venture to express the belief that from one-half to three-fourths, would have shown better results if other methods had been employed.

For my own guidance I have relegated the electro-cautery to a field, which is gradually narrowing and the following list includes *all* the conditions for which it is ever used. Epistaxis, vascular tumors, turbinal hypertrophies involving the soft tissue *only,* hypertrophy of lingual tonsil and hypertrophy of the faucial tonsils if slight, if hæmorrhage is feared, or when the consent to the cutting operation is withheld. Mycosis of tonsils and pharynx, and small posterior growths, located so as to be inaccessible by other means, may require the cautery.

In some of the above, the electro-cautery is preferred, but in many it is only an adjunct to some other operative measure.

There is much to be said on this subject from the pathological standpoint, but it was only intended to include in this brief paper a few ideas which have suggested themselves to me from time to time and which I believe are worthy of thoughtful consideration.

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Discussion.

Dr. T. M. Strong: I am sorry that I did not have a chance to read Dr. Townsend's paper, and that I came into the room too late to hear it, so that what I may say may be a partial repetition. There is not the slightest question that the electro-cautery is as easily abused an instrument as any we have in our hands, especially in rhinological work. I do not think it can be abused as much in the throat as in the nose. It is abused there, of course, but we have more protective conditions there, tissues which will take care of themselves in better ways. In cutting off the tonsils with the snare or cautery, you leave a certain aseptic state, and the parts heal kindly. It would be a pretty severe mutilation which any man would give the tonsils that could cause lasting trouble. But when you go to work in the nose, and particularly in deformed or narrowed nares, it is a different question. Its use on the septum itself is almost prohibitory, I think, with the exception, perhaps, of persistent hæmorrhage, where the fused nitrate of silver, or chromic acid, *et cetera*, will not control it. I have seen one or two such cases, in which the touching with the cautery point at a light red heat, used quickly, seemed to set up curative repair. It was used in a limited space. It may be of service in some œdematous conditions which occur upon the septum, high up, in some forms of hypertrophic rhinitis, provoking spasmodic sneezing. For small septal spurs it is useful, as a single application may remove them. I have never used the cautery upon the middle turbinated. I have used it quite freely on the inferior tubinateds, and in my own paper have referred to another technique to take the place of the general use of the cautery, and the advantages of it. Cases are reported where meningitis had followed the application to the middle turbinateds, due to the intimate anatomical relationship between the cerebral sinuses and the ethmoidal venous plexuses. It hardly seems possible that such results would follow other than the abuse of the cautery. In pharyngitis, of the follicular form, and where we have the enlargement of the tissues on the lateral walls, behind the posterior pillars, in the post-nasal space, the application of the cautery gives good results. Used within its proper limits the electro-cautery is of valuable service, and without it we would be seriously handicapped in our attempts at successful results.

Dr Hooker: For a number of years I have used electrolysis in the contraction of soft tissues, no matter where situated—whether it be to remove a mole from the face, or a hypertrophy from the nasal cavity. I think I have not used electro-cautery in three years. I use nitric acid and chromic acid very seldom. I restrict the use of those acids almost entirely to the very soft hypertrophies of young children. There a touch of chromic acid that acts very well indeed. The surface of the mucous membrane is covered with delicate epithelial cells, whose function is very important. This mucous membrane of the nose is very precious to the patient, and that method is most successful which will give you the largest amount of space with the least destruction

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of tissue. I brought forward this method of treatment to this society at Buffalo, and last year at Chicago, as I prefer it to any other in the reduction of hypertrophies. I have been intending to use it in nasal polypi, particularly in those cases which are difficult to snare where they are flush with the surface from which the growths spring, but I have not got at it yet. I do not see why you cannot introduce the point of the needle at the root of the polypus, and cause absorption, destroy the tissue in this way and have your polypus drop out just as you would destroy a wart on the hand with it. I have used the single negative pole, and one of the questions I would like Dr. Strong to answer is, what advantage the bi-polar method has? It is the negative pole, as I understand it, that does the business; hence, I have the patient apply the positive pole on the back of the hand, thoroughly moistened and I put the negative pole, attached to the needle, in the place where I wish the contraction to occur. The disintegration of tissue takes place entirely beneath the mucous membrane. All the damage you have done is a minute puncture of the membrane, and I get far better shrinkage—a greater amount of room—following the application, practically without the unpleasant reaction afterwards, than I had by using acids, or the galvano-cautery. I am very favorably impressed with this method of reducing hypertrophies. One treatment cannot do it all, several treatments are needed; but that, as the doctor says, is true of chromic acid. I have found that four to six milliamperes are ample, and two to three minutes length of time is sufficient. I do not know but I will try a longer time, since the doctor has gone as far as five minutes with ten milliamperes, but with the smaller dose I have got very satisfactory results in these hypertrophies.

Dr. Rice: I wish to speak of a method, the results of which are quite similar to those advocated by Drs. Strong and Hooker, for reducing excessive hypertrophies. It consists of the use of a long, small trephine propelled by a small electric motor. This trephine is introduced into the inferior turbinate and slowly pushed backward as far as may be necessary; then a little pressure is applied outside of the turbinate against the mucous membrane by means of a cotton pledget. The result is extremely satisfactory in the majority of such cases. There is very little hæmorrhage, apparently very little pain, and it seems to me that in many cases it is much to be preferred to the use of the electro-cautery against the mucous membrane. I believe, as Dr. Hooker says, that the mucous membrane is very precious and should be spared whenever possible.

Dr. F. P. Warner: The last remarks of Dr. Garrison ought to be remembered where he laid special emphasis on the indicated remedy in the treatment of these diseases. I have been wondering of late whether there is any such thing as a primary hypertrophic rhinitis, or catarrhal condition of the nose. Many of us have removed the sub-lingual tonsil and seen it reappear. We have also applied our acids to hypertrophy of the turbinated, too, and seen the enlargements return. We have also applied the acid treatment for

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hypertrophic rhinitis in children and have seen that condition return; and, it seems to me, that we are dealing here with more of a constitutional condition than a local one. Hypertrophic rhinitis and catarrhal diseases are an indication of something wrong with the system at large. It may be with the food, a tendency toward glandular enlargements from scrofula, or from some other cause. I have noticed also that in the treatment of these diseases, they improve much faster and more permanently, when I have associated with the local treatment the remedy for the constitutional condition.

Dr. A. W. Palmer: There is one method which is a little different from Dr. Garrison's that has not been mentioned to-day. This is the transfixion of the inferior turbinated, which may be done in two ways. The turbinateds being anæsthetized by eucaine or a combination of eucaine and supra-renal, which leaves the tissues quite contracted, you may then either first use the sharp-pointed electro-cautery, introduced at the anterior portion of the inferior turbinated and passed along the lower edge of the turbinated bone, between the bone and the mucosa. Secondly, you may as Dr. Delafield advises very strongly, transfix it by a sharp-pointed canaliculus knife, which inflames the periosteum at the lower edge of the inferior turbinated, and which also inflames and breaks up the little venous capillaries in the turbinates, causing an adhesion of the tissues. This is usually done at the lower portion of the inferior turbinated, right along its edge. I have done it with the canaliculus knife along the inner surface. There does not seem to be tissue enough to pass the cautery knife between the turbinated bone and the mucosa on the inner side. I have had very good results with this method, and prefer it to cauterizing the outside of the turbinated body for the reason that Dr. Hooker has given.

Dr. E. W. Beebe: I formerly used the cautery, acids, and the punctures, but the results were not satisfactory. I found that in course of a few months those cases came back to me with the same conditions they had formerly. Nothing has proved so efficacious in my hands as the removal of the hypertrophies by the use of a saw, and I remove sufficient tissue to insure a perfectly free opening of the nasal passages. This treatment has given me better results than anything else I have used.

Dr. Hoyt: I have had very satisfactory results from punctures with the galvano-cautery after the method mentioned by Dr. Palmer. Some of the turbinates are quite fat, and the cocaine will shrink them down so that it will be hard to make a sub-mucous puncture, but with eucaine it may be done and have just as profound anæsthesia. There is another form of hypertrophy which has not been spoken of very much; that is, the posterior hypertrophy. We all know that the posterior opening of the nostril is about the same size as the anterior while the interior of the nose is quite large. We cannot get any more air through the posterior end of the nose than through the anterior. Even with a large hypertrophied bone there is a good deal of space in most cases about them for the air to pass; but, with a plug acting like a cork,

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sticking in the choanæ so as to fill the space two-thirds full, the air cannot pass through. It is as though you had a cork partially in a bottle. In these cases a snare can be applied very easily under eucaine, better than under cocaine. That treatment seems to have a more beneficial effect in reducing hypertrophy of the inferior or middle part of the turbinates, than to cauterize or shrink the middle part and expect to affect the posterior.

Dr. Townsend: I have just a word to say in regard to Dr. Strong's statement that he considered the electro-cautery could be used with considerable freedom in the throat. I do not think it can any more than in the nose. Possibly it may be less liable to abuse; but I have seen cases of quinsy originate in patients who had never had quinsy previously, and who had been treated with the electro puncture. I have seen quite painful inflammatory conditions arise where the cartilages of the larynx had bee touched with the electro-cautery. The cartilages there are quite as intolerant of the cautery as they are elsewhere. I have also seen a great deal of dryness and discomfort whenever the electro-cautery has been used to destroy the enlarged pharyngeal tonsils, and naso-pharyngeal adenoids, which was practiced quite extensively at one time.

Dr. T. M. Strong: The bi-polar method seems to be a little easier, quicker to use. You have everything right under the control of one hand and one foot, whereas you have got to manipulate the wet electrode on the patient.

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TOBACCO-ALCOHOL AMBLYOPIA; WITH PECULIARITIES OF COLOR VISION. ARE THE LATTER CEREBRAL OR RETINAL IN ORIGIN?

By Joseph T. O'Connor, M.D.,
New York.

THE title at the head of this paper has been deliberately selected notwithstanding the use in ophthalmological literature of the terms "retrobulbar neuritis" and "axial neuritis" to express the abnormal conditions herein descibed.

My objection to the term retrobulbar neuritis as a synonym for tobacco-alcohol amblyopia is that the former term includes at times conditions not present in the tobacco-alcohol optic nerve affection; and the designation axial neuritis is verbally incorrect since the affection is at best para-axial and that in a short portion only of the retrobulbar course of the optic nerve.

In my opinion enough pathological data have been gathered to justify the use of the term papillo-macular fascicular ascending optic neuritis.

The history of the case which forms the basis of this paper is as follows:

Case One.—Mr. ——, aged a little over 50, of marked neurotic heredity, has always enjoyed fairly good health, some amount of catarrhal dyspepsia being the chief of his ailments.

He has always enjoyed the pleasures of the table, has been a moderate user of wines and spirits as beverages and has been a devotee to the use of tobacco for many years.

Some five or six years ago one morning after a late night dinner with plentiful accompaniment of stimulants and tobacco he noticed that the outside world, the atmosphere, the sky, the buildings and people appeared strange to him; he was unable to describe the altered appearance beyond saying that everything was too bright. Exercise in the open air for an hour or so relieved the condition and things again seemed normal.

This manifestation appeared later after other "good times" but it took a longer period of open air exercise to dissipate the effect.

Late in the Summer of 1898 the patient was struck by the extreme brightness of the blues and purples in the materials of ladies' dresses or in their hat adornments. Upon inquiry, however, he found that such

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colors at that time were extremely bright in tint. Nevertheless, any material of blue color could be recognized by him at a distance far beyond that at which he could distinctly perceive black or brown as such.

In October he began to notice that yellows seemed intensified, ordinary yellow paint becoming of a golden tint while the gilt signs seen over the shops had become like luminous amber.

A little later while reading and accidentally closing one eye, to the open eye the type at the outer (temporal) side of the field of vision appeared blurred as if the printing-ink had been rubbed over while still moist. Then becoming somewhat alarmed he came under treatment.

Ophthalmoscopic examination late in October showed marked paleness of both disks, perhaps more to the temporal side of each, while the veins were enlarged and tortuous, the arteries narrow.

Perimetric examination showed the existence of a scotoma in each eye for red and green. The scotoma was spindle shaped in outline, placed nearly horizontal, extending in the chart from just without the fixation point to a point beyond and including the blind spot.

His refraction, with glasses that had been prescribed some months before, was 20/20 if the reading was done slowly.

The trouble gradually advanced, the scotomata increased in breadth chiefly and extended below and to the inner side (as apparent on chart) of the fixation point, by degrees invaded the latter first in left eye and later, by April, the right. By this time reading a newspaper became impossible except the large type in the head-lines. The patient becoming really alarmed stopped the use of alcohol absolutely but continued that of tobacco in a lessened amount.

Ceasing the use of alcohol seemed to have no influence on the difficulty in seeing; the air at a distance of 200 feet and beyond, seemed hazy or dusty and at a distance of thirty feet faces could not be surely distinguished.

One peculiarity of the case noticed in October was that the faces of those whom he met on the street were corpse-like and yellow, as if of those who had died of yellow fever. The yellow tinge of the faces of passers-by gradually disappeared until by December the tint was simply ashy-white.

The scotomata were rarely positive, although at night when reading they would appear and were then of a faint rose-purple tinge and were relative, as the letters could be seen through them.

One peculiarity worthy of note appeared about December and continued until late in March, only occasionally after the latter date.

This peculiarity was the appearance in the scotomata when reading of groups of fine lines arranged as arcs of concentric circles. The drawing (Fig. 1) illustrates this. In my opinion this was a shadow effect due to the invasion of masses of nerve fibers of the papillo-macular bundle becoming opaque and casting shadows appreciated by the percipient elements of the retina as yet uninjured.

The disappearance of these lines from the page might be accepted

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as evidence of improvement in the trouble were it not for the continuous increase of the smoky appearance of the atmosphere and the increasing dimness in the outlines of even large objects at a relatively short distance.

A variation of this symptom is the "projection" of these lines on the faces of passers-by, especially women wearing small-meshed veils or men having a day's growth of beard evident; or even in looking at the sky. Here the lines are much longer, apparently five or six inches, wavy and parallel. I use the term "projected" but am unable to understand how the enlargement is produced. A similar case is mentioned at the end of this paper.

One symptom that has annoyed the patient is the quivering of the sky or of a diffuse light when looking at it. A similar condition is mentioned among the other cases recorded herein but according to W. F. Norris it is seen in cases of neurasthenia, especially of sexual type.

Red, if seen at a distance of more than a foot or so, is dingy if it be a dark red or flame-colored if it be light red. When seen within two or three inches of the eye the rays enter at a wide angle and affect portions of the retina outside the scotoma and then are properly perceived. Green acts similarly but there is no confusion of the dingy red and the dingy green.

Within the scotoma both blue and yellow appear pale, that is diluted with white, a very puzzling occurrence under any theory of color vision.

A gas flame or the light of an incandescent filament gives a paradoxical result according to the distance at which it is seen. If seen at a considerable distance, 250 feet or more, such light appears as a luminous mass of amber; if seen at a distance of a foot it is plainly outlined and is of a dense ghastly-white appearance.

When seen close at hand such flame ought to affect elements of the retina beyond the scotoma and hence should have its normal yellow-white color, while when seen at a long distance, chiefly the yellow spot and its neighborhood in the scotoma being affected, it ought to appear diluted with white as does the yellow object in the perimetrical examination. Of course the narrowing of the pupil resulting from the presence of a bright light at close range may account in part for the contradictory results just mentioned.

Without attempting to enter deeply into the theories of color vision it would seem that the peculiarities of this case cannot be accounted for by the Young or Young-Helmholz theory which considers the recognition of what we call yellow to be a composite effect of the influence of the red and green rays, thus not admitting a physiological basis for the independent existence of yellow as a primary color.

The Hering theory does admit the necessity of the latter, but even then we cannot readily account for the amber tint of many yellows

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FIG. I.—Showing the scotoma of left eye in reading a newspaper. The inner broken outline is that of the scotoma as it was in December, 1898; the outer continuous line is that of the scotoma at the time of sending this paper to the press (November, 1899). Fixation point is marked by a cross; the blind spot by the heavy circle. The groups of curved lines are too large and the lines themselves much too thick. These lines appear to be unconsciously suppressed when the patient is trying to read, but when his attention is directed to his trouble they appear to him.

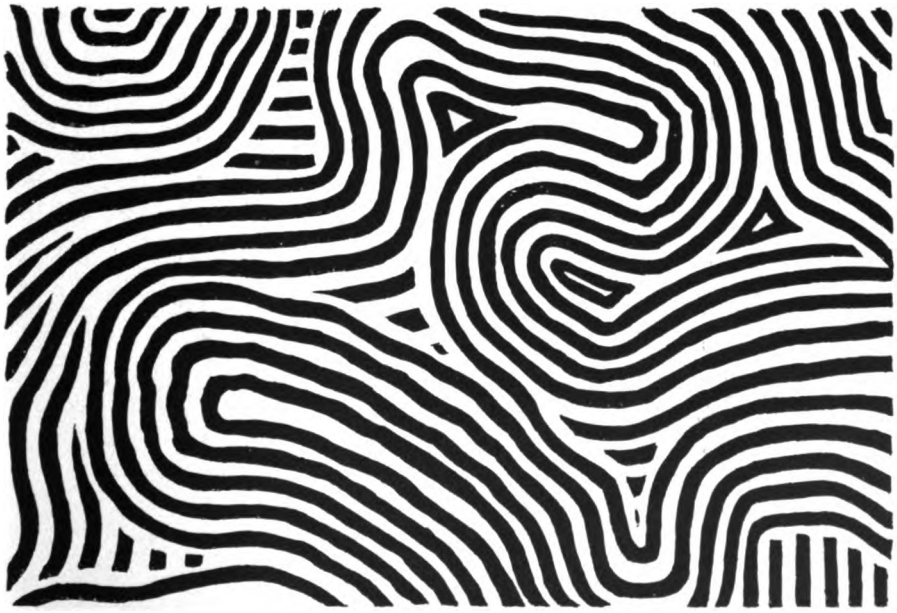

FIG. II.—Showing the appearance, as near as may be, of the lines when seen in looking at the sky or a rough wall, etc. The figure only shows the general effect of the curves: the lines should be very much closer together and of extreme fineness.

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except by the over stimulation of the green perceiving elements since amber is only a yellow tinged with green.

Without searching the recent literature of the subject of color vision it seems to me that our knowledge of it will be (as has been the case in many departments of neurology) advanced more by continuous and careful records of alterations in color perception in disease than by investigations of the normal eye alone.

With the intention of following out the subject as far as lay in my power I have questioned several sufferers from optic nerve atrophy as to the alterations in color perception first noted by them when vision began to fail and limiting the questions to this point.

Case Two.—Mr. A. *Locomotor ataxia;* has been under my observation for two years. Disks both atrophic and bluish gray. Vision as if in a fog, large objects but dimly perceived when near. This patient's vision began to fail some six years ago and he then noticed that the faces of acquaintances and passers-by were "chalky" in color, and at the same time all the faces appeared wrinkled. In this case the same appearance of tint in the faces of others existed as in the first, while his statements as to the wrinkled appearance of faces was undoubtedly the shadow effect of the projected lines seen by my first case.

This patient although having undoubted primary atrophy of the optic nerves states that for years before the beginning of ocular symptoms he had used both brandy and tobacco to great excess, and this fact leads me to the view that his optic nerve trouble may have begun as a tobacco-alcohol amblyopia implicating first the papillo-macular bundle.

Case Three.—Patient in Dr. Boynton's clinic. Middle age. Optic nerve atrophy of primary variety. Vision; sees outlines of large objects as through a fog. The first knowledge of his failing sight occurred three years ago when he remarked upon the extreme whiteness of his nephew's face. His remark was greeted with derisive laughter and he was told that the boy had an exceptionally ruddy countenance. This patient has had no appearance of lines either on the printed page or upon other objects but he is even now sensitive to blue, and white causes pain (photophobia). This patient denies any excessive use of tobacco but admits that for two or three years preceding the first symptoms of visual disturbance he had associated with a "fast set" in London who drank a great deal of spirits. I think it is not assuming too much to consider this case like No. 2, the optic nerve atrophy beginning, as the result of alcohol-tobacco poisoning, in the papillo-macular bundle.

Case Four.—Patient in Dr. Shepard's clinic. Optic nerve atrophy of right eye; left eye has fairly good vision and disk appears normal. This patient has had syphilis and at first the trouble in right eye was ascribed to that cause. Subsequent examination revealed a wide spindle-shaped scotoma for red and green with great loss of general perception of form. He sees with right eye as in a fog but of a face near at hand

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the features are obliterated. This patient has used tobacco extensively, by chewing, and liquor as well. He has not noticed changes of tint in the faces of others or the appearance of the lines, but as he is not educated his statements in this regard cannot be taken as conclusive. The right disk appears atrophic but both veins and arteries are small.

This man when looking at the sky sees its light quivering and trembling. His is the only one here recorded, except the original case, in which this symptom appeared.

Case Five.—Dr. Shepard's clinic. Young woman, aged 26, unmarried. Atrophy of both disks; no cause discoverable. No scotoma; fields concentrically narrowed, yet as she notices marked paleness of people's faces it must be assumed that there is loss of perception of red in the central region of the retina.

Case Six.—Dr. Boynton's clinic. Patient has double optic nerve atrophy undoubtedly following a papillitis as there are still evidences of exudation. This patient sees as in a fog. His only color-symptom noted at the beginning of his visual loss was the appearance of "sparks falling from the eyes." The case is not to be included with those of papillo-macular origin anatomically.

Case Seven.—Dr. MacBride's clinic. Negro, aged 26. From the West Indies. Has had syphilis. Complete optic nerve atrophy. Locomotor ataxia. Has never used tobacco nor any form of alcohol. His visual weakness began as a misty appearance of the atmosphere and has increased until now all before him is in a thick fog. Has had no alteration in color sense nor any appearance of the lines. The case is not to be classed with Nos. 1, 2 and 3.

My purpose in offering this paper is not to assert any new principle in the subject of what we know as the color-sense but to elicit discussion among the members of this Society who have many more opportunities than fall to me to observe the course of tobacco-alcohol amblyopia.

I therefore do not attempt to draw any conclusions from the facts as recorded but feel justified in offering as tentative propositions the following suggestions:

I. That possibly a series of closely observed cases may give a basis for a new theory of color vision.

II. That such a series among locomotor ataxics, paralytic dements, or those having cerebral syphilis (presumed or proven) may show the beginning of optic nerve atrophy when present to have been in the papillo-macular bundle and with some or all of the changes of color perception characteristic of the so-called tobacco-alcohol amblyopia. If this proposition can be established in those previously addicted to the use of tobacco and alcohol it will explain the hitherto unexplained occurrence of optic nerve atrophy in those cases.

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III. As a corollary to the latter proposition; that the toxic amblyopia mentioned when occurring in a patient who has had syphilis, has a greater tendency to extension as a general optic nerve atrophy than in one who has not been infected with syphilis.

I wish to record my obligation to the Surgeons and Assistant Surgeons of the New York Ophthalmic Hospital (some of whom are herein named) in placing at my disposal material from their clinics.

DISCUSSION.

Dr. Harold Wilson: In the title of this very interesting paper occurs a query which the paper itself does not attempt to discuss. It seems to me that when we have pathological changes in the eye or along the optic tract with associated abnormalities of color-vision, the inference is more than justifiable that the former include the latter. The perception of color, in common with other perceptions is a mental act, but the mechanism of the sensation is primarily retinal. I think we hardly need to look beyond the retina and optic nerve for the immediate pathological explanation of acquired color-vision abnormalities.

Since receiving this paper for discussion, I have had no opportunity of making any observations along the lines suggested by its author, but I am very much in accord with him in the belief in the desirability of a searching study of the color-vision in pathological cases as a promising aid to a better understanding of the theory of color-vision. We have not reached a perfectly satisfactory theory up to this time, so that it is a field worth cultivating.

If any refinement in nomenclature is necessary, the author's suggestion is a good one, but even at the risk of losing some accuracy, I question whether we might not generally prefer a short name like "*papillo-macular neuritis*" rather than a long one like "*papillo-macular fascicular optic neuritis ascendens.*"

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IMPORTANCE OF BACTERIOLOGICAL STUDY.

By Charles Leslie Rumsey, M.D.,
Baltimore, Md.

SOON after the invention of the microscope in the latter part of the sixteenth century, minute organisms were found, by its aid, in decomposing substances. Various workers in this field began to associate these organisms with disease. The means at their disposal were insufficient to prove any theory until Lowenhoeck of Delft, Holland, about 1700, perfected the microscope. In his youth, Lowenhoeck had learned the art of grinding lenses by which he deducted sufficient optical laws to construct a microscope. It was not, however, until 1863 that any positive advance was made in identifying a bacterium with a disease.

Bacteriology has now become a science in itself, and hundreds of earnest investigators have so perfected this branch of study as to bear an important relationship to both medicine and surgery.

Within the last decade, bacteria have laid a very strong hold on the imagination and thought of the scientific world, and have come to be looked upon as playing a most important role not only in the production of disease and in fermentation but also in many every day processes hitherto supposed to be dependent on very different causes.

In the last twenty years, however, owing to the vast improvements that have been made in the methods of cultivating these organisms and especially in obtaining what is known as a pure culture, that is, a culture that contains only a single species of organism, most valuable data as to the function and biological chemistry of these minute organisms have been rapidly accumulated. Once a pure culture became available, it was an easy matter to determine the conditions under which a special bacterium would grow, for example ærobic or anærobic. The appearances under the microscope can give us no information on many of these points and it is only by a most careful study of the life-history of these organisms that any accurate information has been obtained. It is evident from the consideration of all these facts that bacteria must be looked upon as being governed by much the same laws which govern other plants and animals. They are composed of protoplasm and their idiocyncrasies are always in the direction of their specialization. Through this branch of study, thousands of valuable

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lives have been saved in our surgical wards. And only when we extend this study into the formulation of the best sanitary laws that should govern a municipality can we estimate therefrom the benefits to humanity.

The claims of bacteriology must certainly merit our consideration. They involve questions of prophylaxis and diagnosis which mark the beginning of a new era in medicine, and discoveries in bacteriological pathology have extended the field of therapeutic measures. It demonstrates that a physician's chemical laboratory should be a part of his required outfit.

We, as a distinctive school, must not stand idly by with closed eyes, contentedly holding on only to a symptomatology of one century ago. Had Hahnemann anticipated, his followers would be averse to all progress and search after truth, the writer believes he would have deplored the day he laid the foundation for our school. As it is believed that Homœopathy is founded on an immutable law of nature, every natural principle revealed will tend to elucidate our law of cure and aid in its practical application. With this conviction we should fearlessly investigate every department of medicine and hail every principle discovered as an ally of our own. Let the human organism suffer a breach of the integrity of its protecting surfaces—the skin and the mucous membranes—we can have a favorable nidus for the development of bacteria. Reduce the power of resistance of the cells by an unusual expenditure of nerve force in excesses of functional activity, we shall find invading armies of micro-organisms in active struggle with internal resisting structures, resulting either in the destruction of the invading bacteria or their hosts. Prevent the entrance of these germs and no infection will occur. This must assure us the need for absolute surgical cleanliness in all surgical operations.

Plastic operations about the eye involving the use of large flaps either with or without a pedicle are undoubtedly much more successful now than formerly. And no one will deny that this increased success is due in large measure to the more vigorous exclusion of bacteria from the field of operation.

Gonorrhœal conjunctivitis, acute catarrhal conjunctivitis, trachoma, phlyctenular conjunctivitis, phlyctenular keratitis, serpentine ulcer, hypopion, foreign bodies in the globe, sympathetic inflammation have all been the subject of laboratory experiments with reference to bacteria. If we do not concur in all the theories which have been

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evolved, the large number of recorded facts cannot but have a permanent influence upon future opinion.

In the dust and crusts of mucus and débris in the nose deposited among vibrissæ of healthy subjects, micro-organisms were always found in abundance. On the Schneiderian membrane the reverse is the case.

The close relationship existing between the eye and the nose and the adjoining cavities allows the migration of organisms from the nose to the eye or conversely. It is thus true that diseases of the lachrymonasal duct and lachrymal sac are most frequently caused by pathological conditions of the nose.

The mucus within the nose was most carefully examined for bacteria in twenty consecutive cases. No attempt was made to identify the various forms of cocci and bacilli except to search for streptococci and staphylococci. There were only two cases out of the whole number that contained the streptococci and in these cases there were nothing special to report in the condition of the nose. The mucus was found sterile when taken from the Schneiderian membrane in rabbits. It was determined, from these experiments, that the mucus membrane of the nose had marked antiseptic properties.

Mycosis may be observed clinically and microscopically in any situation in the air tract—pharynx, base of tongue, faucial pillers tonsils, nose—and, also, in the ear. Except one case, mycosis of the ear, it has always been found in the female sex in my practice. Bacteriological examinations were made in four cases, in each one of which was found the organism.

My colleagues have told me the Klebs-Loeffler bacillus has been reported by the Health Department in cases attended by them where there has been a malignant type of diphtheria and where there has eventually formed no diphtheretic membrane.

The writer recognizes the importance of the study of bacteriology and is assured of its scientific value in both surgery and medicine. There are many queries, however, which perplex him. They can be deducted from the statements herein made, together with the experiments made by the writer himself and other citations.

Are diseases less malignant or less severe or less protracted or cures more frequent by the knowledge of the germ theory? Mankind has certainly not conquered germs. Influenza, a disease epidemically unknown to Europe and the United States before the advent of the germ theory, is to-day a horrible reality. The deaths directly attributable to

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this epidemic are innumerable. Otitis media suppurativa still accompanies scarlet fever. Hay fever gives as much misery to a patient as previous years. Crede's prophylactic measure has diminished ophthalmia neonatorum ninety per cent. but gonorrhœal conjunctivitis or ophthalmia neonatorum is as destructive a disease as before Crede's discovery.

The conclusions are:

First: The germ theory has spurred men to the necessity to use the microscope and perfect themselves in diagnosis.

Second: It has not promoted more cures but made the doctor more cautious in his treatment.

Third: By Koch's rules the bacteria must cause the disease, but the bacteria may be in existence without the production of the disease.

DISCUSSION.

Dr. Hoyt: I agree with Dr. Rumsey that the subject of bacteriology is approaching a transitional stage. There is a good deal of what is commonly called chaff in bacteriology: that is, there has been a great deal written and a great many investigations made, which are of no practical use. It is a very interesting study. It is very interesting to know whether we have staphylococci, or streptococci; but they are not, as a rule, of any practical benefit. For those connected with this section, there are three forms of bacteria, which are of real, practical importance. They are the tubercle bacilli, the diphtheria bacilli, and the gonococci. Of course, the germ of glanders is of importance, but we run across this disease so very rarely here, that it is hardly worth considering; although, as we saw by the paper, only last week, the man who has done more in the study and development of glanders than anyone else, died as the result of infection while engaged in his work. It is very important to know when we have a case of tuberculosis. There is nothing that will give us a more absolute diagnosis of tuberculosis than finding the tubercle bacillus, either in the sputum or in the encrusted tissue, according to the form of tuberculosis we may have. In the cases of diphtheria, the Board of Health has taken an immense weight off the general practitioner's shoulders by assuming the responsibility of declaring whether a case is diphtheria or not. It certainly helps the public when the Board of Health says that a case is diphtheria, to take more active precautions in prophylaxis than they would if the physician alone said so. I think it is very important, in every case of a suspicious tonsillitis, to have a culture made. In diseases of the eye and sometimes of the nose, the result of gonorrhœal poisoning, I think it is necessary to have a bacteriological examination made. I am glad Dr. Rumsey said that he thought Hahnemann would have believed in bacteria if he had lived now. I think he would have been a progressive man, instead of one staying in the same rut as some think he might have done. Some

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day in the near future we are going to know and be able to differentiate the germ of syphilis. Then we will be able to diagnose syphilis much better. I heartily believe in bacteria: I think that the bacteria are the cause of the disease and not the result, in most cases, especially in the three I have named, of tuberculosis, diphtheria and gonorrhœa.

Dr. Rumsey: I cannot concur with Dr. Hoyt in the expression that gonococcus is rather the result of gonorrhœa, not the cause of it. This is contrary to the experiment I have made with gonococcus in the conjunctival sac of a rabbit's eye.

Before a bacterium can be said to be the cause of a disease, Koch states:

First: It must be found in the tissue or secretions of the animal suffering from, or dead with the disease.

Second: It must be cultivated outside of the body on artificial media.

Third: A culture so obtained must produce the disease in question when it is introduced into the body of a healthy animal.

Fourth: The same germ must then again be found in the animal so inoculated.

But I cannot understand, for instance, why Klebs-Loeffler bacillus could be found in the throat without the production of a diphtheritic membrane. The best solution, that I can give for this and other queries in my paper, is the soil must be congenial to the bacteria for the production of the associated condition. And the Homœpathic remedy can give greater resistance to the tissue which prevents the latter from becoming a favorable nidus for their growth or can abort the disease.

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ELECTROLYSIS IN HYPERTROPHIC RHINITIS.

By T. M. Strong, M.D.,
Boston.

WE only desire in this paper to add a word in regard to the use of this agent in those conditions which are so frequently met with, and where more or less destruction of the mucous membrane is the result of the usual treatment by caustic and electro-cautery. It is applicable to all except the youngest children, and possibly very nervous patients. I have used it in children as young as ten years of age, and failed with those much older. This is a disadvantage, but the electro-cautery offers very little, if anything, more in the same class of cases, to say nothing of the possibility of burning extraneous tissues. Dr. W. Scheppegrel, in his recent work on "Electricity in Diseases of the Nose, Throat and Ear," refers to this method with rather a favorable bias. Dr. Morris J. Asch, in the "American Text-Book of Eye, Ear and Throat," says that "electrolysis has been recommended by some authors; but the uncertainty of its results, and the slowness of the method, have prevented its being used extensively."

While the uni-polar method has been used with some beneficial results, the best, and only, method, is with the bi-polar electrode, which, as compared with the former, is said to possess the following advantages: "More rapid application, less painful, more definite in its action."

In the cases in which we have used this method, some twenty in all, the results have seemed certainly as favorable as with the moderate use of the electro-cautery. The most important point being the preservation of the mucous membrane practically intact, for the needle punctures heal at once. Other advantages are the absence of any slough, and avoidance of the danger of synechiæ. With some there is very slight reaction, while in others it is more severe, the pain of a dull, nagging character, lasting for several hours, while the nostrils feel full or stuffed up. This reaction, however, is not as severe as seen in some cases, where the electro-cautery has been used, while in the majority of cases it is less. The application may have to be repeated several times, but as the pain is only at the moment of puncture, this is not a serious objection, and the same thing holds good with the

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cautery. By puncturing at different points, antero-posteriorly, at the several sittings, the whole length of the inferior turbinated may be treated. We have not had occasion to try this method on the middle turbinated, but do not see any reason why it should not be as satisfactory as on the inferiors, and where, as a rule, the use of the cautery is contra-indicated. It is said that the shape of some nostrils may prevent its use, but under those circumstances the cautery would hardly be more serviceable.

We have used the Nosmas cells, with an electro-motive force of a little over one volt to a cell. The application was made with the bipolar electrode, using six to eight cells, with a current of five to ten milliamperes, for five minutes.

My patients, as a rule, rather prefer the electrolysis to the cautery, where a trial of each has been made.

The fact that the mucous membrane of the nose is so well-preserved ought to make this method the preferred one in hypertrophic rhinitis, especially when no harm can result from failure to relieve, whereas, with the cautery, as we know, to our chagrin, the harm done has been a serious protest against its use. Very little oozing of blood follows the removal of the electrode, very seldom is it necessary to leave in a plug longer than while the patient is in the office. Sometimes if the needle is not fully buried in the tissues, or protected with a shellac coating, you may get a slough at the point of entrance, but it is of a minor degree of severity. We have not been able to use a current of over ten milliamperes, nor is it usually necessary, in only a few cases, the average patient objecting to the stronger current.

DISCUSSION.

Dr. Townsend: I have just a word to say in regard to Dr. Strong's statement that he considered the electro-cautery might be used with impunity in the throat. I do not think it should any more than in the nose. In the throat, perhaps, it may be less liable to abuse; but I have seen cases of quinsy develop in patients who had never had quinsy previously, after the electro puncture. Have also observed quite painful inflammatory conditions arise where the cartilages of the larynx had been touched with the electro-cautery. The cartilages here are quite as intolerant of cauterization as they are elsewhere. A great deal of dryness and discomfort where the electro-cautery has been used to destroy pharyngeal and naso-pharyngeal adenoids (as was quite extensively done at one time) is commonly observed.

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HYPERTROPHIC RHINITIS.

By John B. Garrison, M.D.,
New York.

HYPERTROPHIC RHINITIS is a chronic inflammation of the nasal mucous membranes, where the blood-vessels become permanently dilated and there is thickening of the deeper tissue sufficient to produce a stenosis of the nasal canal.

By many it is supposed to be a continuation of a catarrhal process, primarily caused by taking cold; other authorities contend that the chronic condition sets in in the beginning, ante-dating the colds themselves, and the contention seems with good show of reason. Traumatism is, no doubt, one of the most frequent causes of the hypertrophic condition in the nose, and injury to the septum, causing deviations, is most frequent, especially during childhood, when falls and bumps are common and the face so often comes in contact with chairs, doors, and floors. The softness of the bones and cartilages during an early period of life causes many injuries here to go practically unnoticed, so that it is entirely within the bounds of probability that these injuries may produce conditions that are the starting point of nasal stenoses later on. Other causes are due to the surroundings, as constant working in an atmosphere laden with dust or noxious gases, which cause the mucous membrane to become irritated and finally inflamed.

A rheumatic habit seems to be the direct cause in some cases, and we have frequently seen a distressing nasal condition pass rapidly away under a treatment directed to the cure of a local rheumatism without thought of the nasal hypertrophy.

Under normal conditions the nasal mucous membrane secretes a pint or so of serum, which is all taken up as we breath so rapidly that we are not conscious of its presence. Under diseased conditions, however, when the membrane becomes thickened, the passage of the serum is interfered with, and the amount given off is less than usual, which causes the blood-vessels to become overloaded, and distention ensues. The discharge from the nose then becomes thicker, and has a tendency to become lodged in the canal or drops back into the pharynx, to be hawked therefrom.

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As the hypertrophy increases, nasal stenosis is more apparent, and mouth breathing becomes necessary upon exertion, and at night in cases where it is not noticed in the day-time, the mouth-breathing is frequently a prominent feature.

As the secretion becomes thicker, the accumulation at night is larger, and becoming more or less inspissated, it often requires considerable effort in the morning to dislodge it, and irritation of the pharyngeal mucous membrane, and a constant sensation as of something in the throat that must be cleared away, is a constant annoyance. As a result of the breathing through the mouth so much we have a dryness of the mucous membrane, and a troublesome cough is frequent; elongation of the uvula is said to be the result of nasal inflammation. Deafness is a frequent result of hypertrophic rhinitis. Headaches are frequent, particularly in the frontal region, and from the pressure of turbinateds against the septum and consequent imperfect drainage, the accessory sinuses frequently become the seat of inflammation.

The mental powers may become impaired, incapability of attention to business from the mental dullness may occur, and sometimes even intelligent speech may be almost impossible. In all severe cases the general tone of the system is much below the proper standard, owing to the lack of proper oxygenation of the blood.

Diagnosis.—Using a nasal speculum and having the patient in a good light we see the mucous membrane to be of a pinkish-red color, and we notice the thickened and swollen membrane, particularly over the lower turbinated bone and at the prominence of the deviation of the septum, if one occurs. There is usually a viscid, stringy secretion covering much of the mucous surface. Sometimes we may find almost total occlusion of one of the nares from the hypertrophy of the inferior turbinated.

A posterior examination will reveal, when we look at it with the aid of a rhinoscopic mirror, a peculiar appearance.

Lying on one, or both, sides of the septum will be seen whitish, rounded masses, looking very much like grub-worms.

The middle turbinateds are not usually very much enlarged posteriorly, but the inferior turbinateds are frequently so much hypertrophied at their posterior ends, being roughened so as to look seedy after the manner of a raspberry, as to nearly, or quite, fill the oval openings of the posterior nares.

Now make an application of a four per cent. solution of cocaine to

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the whole of the nasal mucous membrane, using for the purpose a small pledget of cotton on a metal applicator, and in a short time there will be a shrinkage of the swollen parts that will permit a much more extended view and will enable a calculation as to the amount of true hypertrophy that exists.

Normally, under cocaine, the turbinateds would present a very thin line, but there will be more or less thickness and roundness to the edges now, in proportion to the amount of connective tissue hypertrophy that obtains. The changes seen posteriorly after the application of cocaine are not so great as they are anteriorally, but there will be some.

Treatment.—Keep the nasal cavities free from all accumulations of mucus. In some cases it will be advisable to use a small application of a four per cent. solution of cocaine or supra-renal extract to contract sufficiently to cleanse the cavities thoroughly.

Where there is contact between the septum and the turbinateds some surgical interference is usually necessary. If the septum presents any deformity, that must be corrected. The hypertrophied turbinateds may be treated by means of the knife, forceps or scissors, but it should be borne in mind that the object of any treatment must be to produce a lessening of nutrition by the contraction of the blood-vessels and a regaining of their healthy tone.

Any operative measure that is likely, by the removal of too much tissue, either by cutting it away in mass or by producing too much of a cicatrix, to produce a condition of atrophy, is to be condemned, and the use of cutting instruments is thought by some to be unscientific, while others, equally skilful, claim for them the most beneficial results, being able to see with accuracy just what they are doing. The treatment should be to conserve tissue where possible, however and whatever form of treatment the individual operator finds best suited to his uses from practice should be used.

Excellent results have followed the author's use of chromic acid and the galvano-cautery, both used with the view of accomplishing the same end. The tissues are first well contracted under cocaine or eucaine or supra-renal extract after the application of the latter; if chromic acid is to be used a few crystals are fused on a probe and applied carefully to the part most prominent, and a retaining scab will result. If the galvano-cautery is to be used the knife should be heated to a dull-red heat and applied by passing it flatwise slowly over the hypertrophy, the result being the same as in the former method. A

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few treatments at intervals of perhaps a week will generally give gratifying results.

The posterior hypertrophies can best be removed with a cold wire snare.

Medical treatment, the remedy being chosen homœopathically, should never be neglected, and in the earlier stages particularly cures can and will undoubtedly follow.

DISCUSSION.

Dr. Isaac Soulé: The distinguished author has, along with many others, found it next to impossible to discuss hypertrophic rhinitis without to a certain extent including the much broader subject of nasal stenosis. The one great fault, it would seem, with the paper is that its author has given us too many generalities and far too little of his personal experiences, too much ætiology and not enough treatment. As to the much discussed point of whether the hypertrophic conditions follow or precede the acute conditions, careful observations would seem to give credence to both propositions. Where the causes producing the hypertrophies are purely, or very largely, local, the hypertrophy in all probability *follows* the numerous, neglected, closely successive acute inflammations. This will, however, account for but a comparatively small per cent. of our cases, the remaining number being due to constitutional conditions which, acting through the vaso-motor and sympathetic nervous systems, become manifest in the nasal mucosa, preceding the acute inflammations, being only aggravated thereby. In the diagnosis much aid may be obtained from using the extract of supra-renal capsules, the tissues becoming exsanguinated under its action much more fully and rapidly than under cocaine, while, as it may be sprayed into the nose, without fear of troublesome after-effects, it can be much more readily and thoroughly applied. The necessity of making the observation, as to color, etc., of the mucosa becomes even more imperative when using supra-renal extract, as the blanching is even greater than that of cocaine. There is one point in connection with the diagnosis of a certain form of hypertrophy of the inferior turbinate which the author has not mentioned, and which I have never seen in print, that I remember. I refer to the hypertrophy of the inner edge, that portion of the scroll, if I may be allowed the expression, of the bone which lies between the body or main portion and the external wall of the nose. This is not visible by either anterior or posterior rhinoscopy, and can only be discovered by inserting a probe within the space described and pressing downward toward the floor of the nasal cavity. I have frequently encountered cases where, to all appearances, the lower meatus was perfectly free, yet the patients complained of a full, stuffy feeling, especially at night. The procedure just described would bring into view a roll of hypertrophied tissue, the

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removal of which gave immediate relief. The treatment must, if successful, be based upon the removal of the exciting cause. If our patient suffers from a chronic indigestion, constipation, kidney or liver trouble; if afflicted with rheumatism, gout or uric acid diathesis; if a woman and suffering from some disease peculiar to her sex, our greatest hope of curing our patient must lie in the careful, painstaking selection of the Homœopathic remedy, according to the totality of the symptoms obtained from the *entire* body, and not merely those of the nose alone. Those of us who have tried the experiment of taking plenty of time to study our case, and materia medica for just *the one remedy* for that case, instead of making an off-hand haphazard guess at what it should be, have been more than repaid by the cures obtained. It takes constant work to practice *good* homœopathy, for the nasal specialist, as well as the general practitioner. Locally nothing has given me the same amount of satisfaction as the scissors or knife and the electric cautery. Where the hypertrophy is localized, cut it off; if general sub-mucous electro-puncture, using a long, thin, narrow, sharp-pointed electrode, has given entire satisfaction. I think less liability to inflammatory reaction follows the use of the point heated to nearer a white heat, than that advocated by Dr. Garrison. The same treatment is advocated for posterior hypertrophies where treatment of any kind is necessary. In the majority of cases when there is a large anterior hypertrophy, the enlargement posteriorly is largely complementary *hyperæmia,* with only a small amount of hypertrophy, which usually disappears rapidly, under the action of the homœopathic remedy, when the anterior hypertrophy is reduced. For hypertrophy of the middle turbinated the snare or some of the cutting instruments is the safest treatment.

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CANCER AFFECTING THE EYE AND NOSE.

By J. H. Harvey, M.D.,
Toledo, O.

CANCER is a term applied to an infiltration or growth, chronic infectious in character, with sharp lancinating, paroxysmal pains, infiltration of the adjacent lymphatics, a peculiar distinct diathesis in which anæmia, cachexia, constipation and prostration are prominent symptoms.

Its stage of incubation is usually long, in some cases extending over many years, during which time it is seldom thought of as being cancer.

It is of protozoic or parasitic origin, and is dependent upon the defects and vices of civilization that tend to produce cerebral and sympathetic depression and exhaustion, such as worry, grief, monotony, sleeplessness, struggle for existence, over-work and use of neurotics. In such conditions of impaired vitality and lowered body resistance there is little difficulty for the evolution of the cancer neoplasm, which, it is fair to presume, has its birthplace from degenerated bioplasm, probably in the pink bone-marrow, where it has easy access to the circulation, and in which it may be overcome and die, or find lodgment in some weakened tissue or gland that has been the seat of irritation or injury, with relaxed blood-vessels, collection of infiltrations and partial death of tissue making a condition favorable to the proliferation of the protozoic parasites. These parasites, as described by Plimmer, are round bodies varying in size from .04 to .004 of a mm. in diameter, with a nucleus surrounded by protoplasm enclosed in a capsule. They are looked upon by many as simply degenerated forms of tissue, but they have none of the reactions of any known degeneration, and are seldom if ever found in degenerated portions of the growth, but in nearly all cases are found in abundance in the zone of its periphery, the developing portion of the growth or tumor.

The line of differentiation between healthy and diseased or infected tissue is very uncertain because of the migratory power of these micro-organisms.

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The toxic product of these active bodies is responsible for the systemic infection of the later stages.

Constipation is present in the great majority of cases, and dates back among the earliest symptoms. This is certainly due to the depression of the great sympathetic with damage to the solar plexus, causing inactivity of the bowels. In every case of cancer of the eye, antrum, nose, or ear, there is a premonitory stage often long associated with chronic inflammation and irritation, producing conditions favorable for the colonization of the parasites where they proliferate, grow and flourish.

Cancer is at first apparently a local disease, but all admit its ultimate malignancy and certain death if let alone. It is in this early stage that the condition should be diagnosed as cancer and treated energetically. The time has passed when we should wait until the patient is forty years of age before we dare to diagnose a condition as cancer. In these days of nervous exhaustion, the stage of incubation is many times passed at the age of 30 years. The frequency and malignancy of cancer have been in pace with the progress of civilization. Among the savage and semi-barbarous it is almost unknown. While nearly all other infectious diseases have grown less numerous, cancer is doubling its victims every ten or fifteen years.

We have been too long treating effect and not cause of the disease. There is too little attention paid to the conditions favorable to its evolution, and the patient is allowed to go on until reaching a stage where only an operation will give any hope for life. It has been his only hope, and he is slow to accept its horror until death stares him in the face.

The curative treatment of cancer must begin in its early stages by both local and constitutional measures upon an antiparasitic and germicidal basis. The patient must be relieved of his condition of impaired vitality, revive the bodily resistance, build up the system, relieve the constipation, promote the action of the skin, vitalize the great sympathetic. And when this is done the local condition will many times disappear.

Locally I use paste in preference to the knife, with few exceptions. A paste that penetrates quickly and effectively gives greater certainty of success, requires the removal of less tissue, and leaves less deformity, with little scar tissue.

The inflammation set up in surrounding tissue by the application of paste is sufficient to break up and destrov any scatter-

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ing parasites for a distance nearly as great as the radius of the surface covered by the paste. Herein lies the secret of the success of the paste treatment, but unless used early it fails if you do not combine with it the general tonic treatment. I keep my patients on a constitutional treatment for about five months after the local condition is apparently well.

To use paste successfully requires just as much skill and experience as does the use of the knife. You should have a knowledge of the form, location, rapidity of growth, stage of degeneration, and extent of invasion of each case. You must also know the effect of your paste in each stage to be able to get the desired effect without unnecessary mutilation of tissue.

Removal should be rapid and complete, or should not be undertaken, as application of mild means simply acts as a stimulant and does more harm than good.

DISCUSSION.

Dr. Wells: I only had an opportunity to see this paper about half an hour ago, and so have not been able to write any discussion of it. The subject is certainly one of the greatest importance, and I confess that I am hardly enough of a pathologist to properly enter into all the details which ought to be considered. It seems to me that the name "Cancer" is rather an indefinite one for us to use, among ourselves at least. We should have a more specific term. I assume that the writer, under the term "Cancer," means neoplasms of both a carcinomatous and sarcomatous nature. In dealing with this subject—one of so much importance—we ought to use terms that would be a little more diagnostic and specific. The pathology of Weichselbaum recognizes two forms of malignant neoplasms: the carcinomata being those of epiblastic origin, divided into those starting in the skin, called the epitheliomata or flat-celled, and those forming in the mucous membrane of the glands, called adenomata or cylindrical-celled. The other form, which I assume the writer includes under this name "Cancer," is the sarcomata, which always start from the mesoblastic layer, or, rather, from those tissues derived from the mesoblast, like the connective tissue. If some such division as this be followed, we will be able to discuss the question of what a growth really is, and the value of the therapeutic measures employed.

With regard to the etiology of any or all these forms, I think that the parasitic nature is not proved; and it seems to me that Koch's law that there are certain things necessary to prove the parasitic origin of a disease, must be insisted upon, *viz.*, that a healthy animal must be inoculated with the germs of the disease, and the disease be produced in some similar form in the healthy animal in which those same

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germs must be again found, to prove the causative relation. Until that is done, I do not think we have any right to claim that a disease is caused by a certain specific micro-organism. Neurasthenia has been spoken of in connection with the etiology. By some recent writers it has been claimed as a direct cause of various growths of this sort, especially the carcinoma. It has been defined by some as "tissue gone mad"—this lack of nerve control over the proper cell development leading to the invasion of surrounding tissue, which is the diagnostic sign, I believe, of malignancy. Speaking of malignancy, another point which ought to be considered is, I think, the question of the juiciness of the growth. In just so much as it is a succulent growth will it invade the neighboring glands and metastasis take place. Another point about which the doctor is not sufficiently explicit is the diagnosis. Especially in the early stages, I know of no way by which a diagnosis may be made except microscopically; and I see no reason why this cannot, in a large majority of cases, be done by simply removing a portion of the growth, if it be large, or the whole of it if it be a small growth, and making sections for a microscopical examination. In judging of the therapeutic value of different measures and deciding as to which are the most successful, the question of diagnosis must be definitely settled, and it is *the* question about which all the arguments will naturally arise. Unless that matter is definitely determined, we shall never know that it was a malignant growth that was treated.

The doctor does not tell us about this paste. I should like very much to know what it is and also his mode of application. I assume that it must be some form of arsenical paste. He also states that the scar tissue will be less. I confess that I have had no experience with the paste treatment, but it seems to me that a clean wound, when a growth has not advanced any farther than it need to in cases of this sort, leaves very much less scar than any large application of a local paste; and, certainly, it must be a much cleaner method of treatment. He also says that this matter must be taken in hand with the "intention of eradicating it, that mild measures do more harm than good." In this very fact, it seems to me, lies the danger of the paste treatment; and I confess that, theoretically, I can see no reason why this sort of treatment would not tend to disseminate the poisonous matter of the growth; and, from my limited knowledge of the subject, I should feel very much safer in removing all the tissue of any suspicious growth that looked dangerous, by clean surgery. It seems to me that that treatment is, theoretically at least, a much better treatment. I do not know what success has attended the injections of erysipelatous toxine. I have read some account thereof, but have not had any personal experience in the matter. Certainly it is a subject demanding a great deal more time and ability than I have to offer in consideration of it.

Dr. Hoyt: I think with Dr. Wells that the paper lacks a proper method for the diagnosis of cancer. No foreign growth can be diag-

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nosed exactly without a microscopic examination. Symptoms do not go for an exact diagnosis, and all the symptoms of cachexia may be present with growths that are not malignant, which under proper treatment will all disappear. The examination microscopically of that same growth will prove that there is no malignancy. And the question of "cancer," which used to apply to almost any growth which might take on an apparently malignant character, is now accepted as only applying to carcinoma. The New York State Legislature has appropriated quite a large sum of money to establish a laboratory under the direction of Dr. Park of Buffalo, to examine into cancer, and find the cause and cure, if possible. I think he would be very glad to know that we had a paper here which told us all about cancer, and how it originated, and what it consists of. In regard to the paste, the doctor said it left very little scar. I never saw any case in which there was not a very bad scar in proportion to the size of the tissue removed, from the little papillomata which appear on the face to the cancer of the breast.

Dr. Haywood: On a patient upon whom I operated a few months ago, I am sure the paste would not have had any effect. She was 68 years old, and had what was called a "tumor" removed from her eye four years before. It returned, and she consulted the same oculist. He told her that she had cancer of the eye, and he would have to take the eye out. She dreaded such an operation, and came to me. I told her that there was no doubt of its being a cancerous growth, and I thought the growth could be removed and possibly the eye retained for some months, possibly another four years. I removed the growth, which was the size of a good-sized pea, attached at the corneo-sclera margin, with the base extending down to the lids and a little on to the lower lid. I removed that under cocaine, cauterized the base with nitrate of silver, and in a few days everything was all right, excepting a little symblepharon which, of course, I explained would be expected. I saw no more of the case for about eight months, when she came back, and I found the growth had returned not where I had removed it, but a little further around toward the outer angle of the eye. The caruncle also had become involved, and was as large as a small cherry. The lid was also becoming thick and showing involvement. I told her then the only thing was immediate enucleation. The first of January of this year, just six months ago, I removed the eye, together with the caruncle and all the inner portion of the lower lid. The eye healed beautifully, and she was discharged from the hospital in a week. There has been no sign of any return of any pain or unpleasant feelings in any way from that day until now. Of course I told her friends that as she was 70 years old that the growth would no doubt return either in the orbit, or, possibly, in the other eye, as at that time there was a slight growth the size of a pin-head at the corneo-scleral junction. The growth was a sarcoma, and I look for the involvement of the other eye in the course of time, if she lives long

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enough. I am sure a paste, in that case, would not have been of any avail at all.

Dr. Phillips: I have had two cases in my private practice of what I diagnosed as epithelial cancer. No microscopic examinations were made. In one of these cases before I saw it the growth had been removed, but at this time was as big as a cherry and had broken down at one point and begun to discharge. The case healed up fairly well under the use of *Arsenicum,* but in the course of a few months it reappeared and I extirpated it. In six months the growth reappeared again, and a suppurative process commenced. She then refused to have any further operating done. I don't recollect, in fact, that I urged it, but I made use of *Arsenicum* again, the second trituration, dusted onto the raw portion of the tumor twice a day. The result has been that the tumor gradually disappeared. It is now between five and six years ago, and there has been no return of the growth. In another case I made use of *Arsenicum* in the same way, and the result has been that the progress of the trouble stopped. The scar is a healthy one along the edge of the lid, and the man has had no further trouble. I have also treated three other cases in the clinic similar to the last. They all occurred upon the lower lid. The one that was the largest was, perhaps, the size of a small pea. There was a raw surface in each case, and I made use of the *Arsenicum* in the same way and the cases healed. I believe that the late Dr. Mitchell of Chicago was the first to suggest this line of treatment; and the cases that I have had under observation have seemed to do so well under this line of treatment I would like to inquire whether any of the members of the society have had a similar experience.

Dr. Keeler: I have given the Mitchell treatment a very thorough trial in my practice. I well remember at the time it was first presented to the profession I had on hand a case of epithelioma of the lower lid at the outer canthus that had been diagnosed as such without any doubt. This involved more or less of the mucous membrane, although it seemed to prefer the skin to the mucous surface. I speak of that because, later on, you will see that in my experience it has followed that where the growth has come upon the skin I have had little or no effect; if it has come upon mucous membrane, I have had very good results. This treatment was continued faithfully for some two or three months, without any diminution in the size of the growth or relief of the symptoms. I then removed it by an operation. That, I think, was nine or ten years ago, and the man is well to-day. The next case that I had was one upon the vermillion border of the lower lip, where the malignancy was such that I had no appreciable results with the arsenic treatment. I removed the entire lower lip, making a V-shaped incision, going down to the base of the chin. Then I performed a plastic operation on the chin, bringing in new tissue from either side to form a new lip, and was delighted with results. To-day the patient is in perfect health. The next case I used this remedy in

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was an eye case, where the growth seemed to be favoring the mucous membrane. In this case I had very fine results. A professional friend, upon my suggestion, used it in a series of cases of undoubted epithelioma of the cervix uteri. Under his treatment I have watched these cases and seen remarkable effects, but not in the large growths, or those that were far developed. Where there was not a great amount of sloughing, ulceration, or anything of that kind, but in the incipiency of these growths, where, perhaps, there would be in some cases a growth the size of a large cherry. In those cases I have seen the best of results. Whether it has been merely a coincidence or not, it has been the case certainly in my practice, using this form of treatment in at least twenty cases, that I have found it of little or no value in cases where the growth has confined itself to the skin, while where the mucous membrane has been involved I have secured the most satisfactory results.

Dr. Harvey: I use several kinds of paste, of different strengths, depending upon the condition. Arsenical paste, composed of equal parts of arsenious acid and gum acacia, is very good for small and superficial conditions, or the destruction of a large amount of diseased tissue, which should be removed rapidly. I use either the chloride of chromium, chloride of zinc, chloride of mercury, or ozone paste. Sometimes caustic potash is used, though it is very severe and requires great care and attention. Some of these pastes will penetrate diseased tissue one inch in twenty-four to thirty-six hours. The paste should be applied once or twice daily, depending upon the location and general condition of the patient. Where it is necessary to penetrate deeply, it is well to cut away the dead tissue every second day. There is some pain, which can be nicely controlled by the internal use of papine or the local use of eucaine with the paste. After the diseased tissue has been penetrated and killed, nature throws it off by the sloughing process. The cavity is then packed for twelve to twenty-four hours with cotton saturated with H_2O_2, which is followed by the continuous application of a stimulating ointment that protects the granulating surface from the air, and in a short time it skins over with very little scar tissue. All my patients are kept upon a constitutional treatment from two to six months. The system should be toned up and the bodily resistance brought to normal, if possible. Herein lies the mistake of many operators, whose cures would be more numerous if they would give as much attention to the patient as to the operation.

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MYDRIATICS, MYOTICS, AND LOCAL ANÆSTHETICS.

By Bushrod W. James, M.D., LL.D.,
Philadelphia, Pa.

THE development of medical and surgical science and the specialties, gradually demanded not only more elaborate methods by which to diagnose peculiar and complicated cases, but more merciful plans by which to search deeper into the human system, which, while often requiring painful and sometimes prolonged examination, compelled the patient to offer physical resistance by reason of his vision of surroundings, together with an involuntary resistance that results even while the brain is perfectly cognizant of the stern necessity for quietness and while being entirely willing to submit to the operation, yet is unable to control muscular action.

Of all the organs of the anatomy the eye perhaps is the most acutely sensitive, while vision is so important as to be very dear to every individual. The eye, unfortunately, is very subject to injury, to disease, to hereditary defects and more likely to be affected by senile changes with advancing age than other organs of the body. Many physicians have been led to devote their entire medical lives to this specialty, for the object of ameliorating suffering and averting blindness, or endeavoring to restore the sight. Formerly the extreme sensitiveness of the organ made even simple examination painful and difficult with even the most stoical patient, while operations were many times unsuccessful from such cause.

It is not marvelous then, that ophthalmologists hailed with keen appreciation the knowledge that there were certain agents that produced anæsthesia and others that caused dilation of the pupil and temporary paralysis of the ciliary muscles, enabling an examination of the refraction to be more clearly made.

MYDRIATICS.

Mydriasis, amydriasis, platycoriasis or coromydriasis or medicinal dilatation of the pupil, being the names given to this desirable condition by the older writers, the preparations from drugs producing this result are now named mydriatics, the most important of which I will herein enumerate, and briefly summarize their properties.

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Atropine.—Atropine was the first, and for a number of years the only true mydriatic known to ocular science. It is an alkaloid obtained from the plant atropa belladonna. It is also present in datura stramonium to a limited amount. It is such an active agent as to cause enlargement of the pupil and paralysis of the ciliary muscle by its local application to the conjunctiva, in solution of one drop of the sulphate to one hundred and twenty parts of water. The usual preparation by oculists at the present day for refraction work is a one per cent. solution, and the action of this strength lasts for seven or eight days. But the effect differs in individuals, the eyes of adults and older patients requiring a much longer time to secure the full effect than those of more youthful subjects.

The discovery of the power of this drug, of dilating the pupil and of paralyzing the ciliary muscle without injury, and thus holding this muscle and the iris in complete subjection for days, was a great boon to oculists, who found themselves permitted to make acquaintance with the optic nerve and the retina and fundus generally, under mydriatic influence, which it was impossible otherwise to gain. In the use of this, and other drugs afterward discovered to have the same power, it was also found that certain dangers attended the use of these toxic solutions. If used in quantity or in great strength, they were liable to flow into the canaliculi and thence into the nasal duct, nasal cavity and mouth, or pharynx, and trickling down the throat, thus being swallowed, produced great disturbance of the digestive organs and nervous system, with the possibility of a fatal result if used in great quantities or the use maintained for a considerable time by frequent instillations. It is, therefore, always advisable to maintain pressure and hold the canaliculi closed during the lengthy administration of any strong solution of a toxic mydriatic, myotic or local anæsthetic when used in the conjuctival sac.

The consensus of opinion is, that atropine is the most desirable of all the mydriatics in spasm of the accommodation or where long mydriasis is required, because added to its length of influence it is the least dangerous. Some individuals, however, are very susceptible to its action, and I have seen the ocular pupils dilated and the throat very red and dry from the continued use of a belladonna plaster to the skin, with unmistakable ciliary irritation, while I have also seen the face deeply flushed with such use. Then again, where small portions have touched the fauces I have marked the throat assuming a very dry, red and

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irritable appearance, these latter symptoms giving a positive denotation of local belladonna intoxication and congestion.

Daturine.—Daturine is an alkaloid from the plant datura stramonium, abundant in this locality, otherwise known as "Jamestown Weed" or "Jimson Weed" in America, and as "Thorn Apple" in the British Islands. The sulphate is generally used, and it is almost identical with atropine in its action, many of the properties of which it possesses. It is also closely allied in its nature to hyoscyamine.

Hyoscyamine.—It is the alkaloid from the plant hyoscyamus niger, the sulphate being in the form of clear needles, soluble in alcohol and slightly soluble in water. It is, if anything, more prompt in its action than atropine, and it has been claimed to be less dangerous than this preparation from belladonna. I have seen serious cerebral disturbances caused by the use of both datura and hyoscyamus, and I am, therefore, led to express a little cautious timidity regarding the use of the alkaloid of either of these crude drugs.

Duboisine.—Duboisine is an alkaloid obtained from the duboisia myoporides. Used in the sulphate it acts more powerfully and quickly than many other preparations, but it is not durable in effect, being, therefore, quite unsuitable for protracted examinations. This drug is considered by some practitioners as useful in mental diseases if administered hypodermically; but even then its action is evanescent, though it may be quite advantageous in diagnosing certain cerebral conditions.

Scopolamine.—Scopolamine, the alkaloid of scopolia atropoides, is in some sense more effective than atropine, but it requires as much, if not more, care in its administration. Scopolamine resembles a preparation obtained from scopolia japonica, or Japanese belladonna, and called scopolenine. Scopolamine is preferred in the form of the hydrobromic salts, and is, indeed, adopted by some oculists as their standard mydriatic. This drug is also used as a sub-cutaneous remedy in the treatment of insanity.

Gelsemine.—Gelsemine is a resinous concomitant of gelsemium sempervirens. It is not only doubtfully variable in its influence upon the eye, but it is also liable to produce a serious disturbance upon the human system, particularly upon the heart. It should be used with extreme caution; indeed, except in special cases I should avoid its use entirely, other drugs being less dangerous and equally as well suited to the attainment of the end desired.

Mydrine.—Mydrine or mydrin is a combination of one part of homatropine hydrobromate to one hundred parts of ephedrine, as pre-

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pared by the eminent chemists Merck & Co. It acts quite rapidly, the pupil expanding in eight minutes, the full effect passes off in about six hours, the diminution requiring only twenty minutes in most cases. Mydrine does not act to any appreciable extent upon the ciliary muscle; its value, therefore, lies simply in its power as a pupil dilator for ophthalmoscopic examination. Ordinary refraction examinations can proceed very satisfactorily while the pupil is under the influence of mydrine, one of its most desirable qualities being that it leaves no unpleasant after effects.

Hyoscine.—Hyoscine, really isomine with hyoscyamine, is one of the drugs which need not be called upon unless in the absence of its complementary mydriatics. It is otherwise administered hypodermically to produce sleep or to quiet the nervous excitement of insane patients.

Ephedrine.—Ephedrine is the alkaloid of Ephedra vulgaris. It is a mild mydriatic, but when combined with homatropine hydrobromate it produces better results than when employed alone. The mydriasis of ephedrine is quite ephemeral; it is, therefore necessary to carry on the refraction examination while both drugs are working at maximum intensity, to obtain their full value.

Cocaine.—Cocaine, the alkaloid of erythroxylon coca, is not an effective mydriatic when used alone, but when combined with other drugs it produces more decided dilatation than can be obtained by any one alone. It is considered particularly desirable in many instances because of its anæsthetic quality. It is very frequently used by oculists in conjunction with homatropine in varying strength, according to the judgment of the operator, most oculists asserting that it intensifies the action of the latter.

Homatropine.—Homatropine is an alkaloid derived from tropine, which is sometimes used as a mydriatic. It is rapid in dilating and safe from after results. As a mydriatic I am quite fully satisfied with homatropine hydrobromate, preferring to use it alone, since I have found in long experience with it that even cocaine admixture does not greatly aid its mydriatic influence. In fact I have discovered that it seemed sometimes to retard or change the action of the homatropine. The latter I have of late years quite adopted as my standard mydriatic. I prefer to use it in a sixteen grain solution recently prepared before application, because the drug loses its intensity with age. My manner of using it to my own satisfaction is by drop instillations, two minutes apart, until I have used three drops. I allow my patient to wait at least one hour

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before beginning the refraction examination. If the drug has been applied several hours, the full action of the preparation upon the ciliary muscle begins to diminish, and in such cases I observe that I do not obtain nearly as fine results as those accomplished when I have proceeded with my examinations an hour, or at most two hours, after the instillation of the drug.

Muscarine.—Muscarine is the alkaloid of agaricus muscarius, fly fungus or poisonous mushroom. It is soluble in both water and alcohol; the aqueous solution, as in the case of all drugs that are thus soluble being most desirable when in use as either mydriatic or myotic. The mydriasis of muscarine is rapid and intense; but the condition passes off quickly. Muscarine is a direct antidote to atropine, and when it is desirable to suspend the action of atropine the injection of a small quantity of muscarine solution produces the desired result in a short time.

MYOTICS.

Myotic is the name bestowed upon drugs which produce myosis, or contraction of the pupil. While mydriatics have the effect of interfering transiently with the vision, myotics rarely cause inconvenience, being capable of making objects appear distinct and clear. This effect is not applicable to the drug itself, however, but to the power of intensifying vision for the near point by contracting the ciliary muscle. The principal drugs possessing myotic power are:

Pilocarpine.—Pilocarpine, an alkaloid prepared from the leaves of jaborandi, by the joint action of hydrochloric and nitric acids. It is claimed by many oculists to be the best of all myotics, being mild though decided in its action, and having no evil symptoms succeeding its use, though it produces great contraction of the pupil and peculiar accommodation.

Arecaline.—Arecaline is the active principle of the betel nut, areca catechu. The hydrobromic salts of the alkaloid is the preferable preparation in use as a myotic. It is very satisfactory substitute for pilocarpine, the greatest objection to its use being the very ephemeral character of its effect, which from its first action upon the iris until complete recovery requires but seventy minutes, and sometimes less time.

Physostigmine.—Physostigmine is an alkaloid of physostigma venenosum, ordinarily known as the calabar bean.

Eserine.—Eserine is isomeric with physostigmine, both being used as myotics. When first used upon the eye, these preparations were

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found to have the power to produce very rapid contraction of the pupil, in some cases the dilating power never returned. It was found also that care must be taken in the use of the drugs, because of their action upon the heart and spinal cord.

Calabarine.—Calabarine, another alkaloid from the calabar bean, is also used in ophthalmological practice, but the sulphate of eserine has thus far been regarded as preferable. In my own practice I find it an admirable remedy in approaching glaucoma when used in quite a weak solution and not too often repeated according to each case.

Muscarine nitrate.—Muscarine nitrate when taken internally produces contraction of the pupils, and is a rapid and efficient antidote to atropine in relieving the extreme dilation of the ciliary muscle. Except for that I would not resort to its use in ordinary examinations.

Morphine.—Morphine, the well-known alkaloid of opium, and opium itself, have been resorted to by some oculists as myotics, but I still prefer to use the less dangerous and equally efficacious eserine, the drug which I have found in active experience a useful remedy for the relief of the ocular tension in most cases of glaucoma and especially useful in recurring attacks of this disease by the continued use of a very weak solution of the drug. When I mention weak solution I mean ten drops of a 4 per cent. solution of eserine to one ounce of distilled water. This may be applied once, twice or even three times a week in one to three-drop applications. I have often found one application a week producing relief without manifesting any uncomfortable action upon the very sensitive nerves of the eye, which this drug will produce if used in strong solution. In other words, I thus gain a medicinal influence upon the eye rather than the full myotic effect, which I believe to be in some cases the cause of the pain and aggravated symptoms attending glaucoma when the strong preparation has been used continuously.

GENERAL REMARKS.

Mydriatics possess more powerful action upon the iris and ciliary tract than do the myotics, overcoming to a great extent any myotic influence, and when applied producing each their characteristic dilating results in a very short time. I have found in practice that there is one thing to be said in favor of the myotics that should be well understood. It is that when a strong mydriatic has been used and very susceptible patients have complained of local distress, cerebral disturbances or capillary hyperæmia, that a myotic, such as eserine, locally applied in

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possibly one or two per cent. solution, will counteract to an appreciable extent the action of almost all mydriatics, and relieve the aggravating symptoms produced by their instillation.

On the other hand atropine, or any of the more powerful mydriatics, will effectually retard myosis, the two antagonistic drugs producing certain spasmodic actions of the iris, thus making examination of refraction utterly impossible.

In the use of any and all of these preparations unabated care must be practiced to prevent the drugs from entering the digestive tract, no two patients being exactly alike in their acceptance of the remedy in operation.

LOCAL ANÆSTHETICS.

The very uses for which anæsthetics are required give voice to the possible danger of their action. At the same time local anæsthetics, at their worst, are far more desirable in most cases to the total anæsthesia produced by inhalation.

No conscientious practitioner will positively assert that there is no danger in their administration, though he is confident that he can make the danger less by great care in administering and by skillful diagnosis of the case in view while the internal anæsthetic is progressing in its effect.

The early risk attending the utilization of chloroform and sulphuric ether gave rise to a strong desire to produce an anæsthetic that would minimize pain without producing unconsciousness. Naturally such an agent must act upon the more external parts of the body instead of through the alimentary tract or the lungs.

Cocaine.—Cocaine was of later years discovered and thought to be the most desirable agent for the eye, and it is invaluable and has become the leading local anæsthetic. But some risk in its free application to persons with weak hearts or lungs, or of a very nervous temperament or of the individuals disposed to tamper with the drug because of its soothing action in relieving pain, have tended to make its use carefully watched and restricted.

Bromide of ethyl.—Bromide of ethyl, hydrobromic ether, has been accepted by many excellent authorities as a safe substitute for cocaine, but it is safe only when it is extremely fresh and pure. Even then it may sometimes have very adverse influences upon the heart, and it has been pronounced quite as dangerous as chloroform to some classes of patients.

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Bromoform.—Bromoform, generally accepted as an antiseptic, has also qualities which name it as a local anæsthetic, its action being quite benign in the relief of pain, but it is quite toxic, requiring considerable care in its administration. It is a preparation of bromum, a non-metallic element of sea-water and saline springs.

Antipyrine.—Antipyrine is an alkaloid produced by distillation from pine tar; it is antiseptic as well as useful as a local anæsthetic. This drug is considered safer than many others of its class, and in normal conditions it is so, but there may be undeveloped maladies or organic defects upon which it may produce deleterious effects. It is for this reason that physicians have seemed to antagonize the use of the drug, while some have been particularly successful with it.

Formanilid.—Formanilid, rather more decided in action than antipyrine, is also used with considerable benefit in some patients, but with this drug as well as antipyrine there is sometimes an evidence of general intoxication, always very undesirable. They are effective particularly as local anæsthetics.

Guaiacol.—Guaiacol is obtained from pix liquida, and forms one of the principal ingredients in creosote. It is more generally recommended for sub-cutaneous injection, having very much the same effect as cocaine. It is quite satisfactory as a local anæsthetic in dental surgery and in other operations requiring but a short time for their performance, but it is not beneficial in ophthalmological examinations or operations.

Carbolated Camphor.—Camphor, carbolated camphor, or a preparation of camphor and carbolic acid and naphtholated camphor, are named as among local anæsthetics by some practitioners, but I do not consider that camphor is quite safe or as efficacious as many other preparations and its sometimes precarious action upon the heart and brain would require extreme care in its administration.

Creosote.—Creosote is a preparation made by distillation from pix liquida, poisonous and requiring peculiar care in its use, or preferably, the strictly medicinal creosote from fagus sylvatica, beech tree. This drug is sometimes used sub-cutaneously simply for the relief of pain. I have never resorted to it in case of operation, but should suppose it both too weak and too transitory to make the operation painless. Its antiseptic qualities are certainly most desirable in any event when used sub-cutaneously.

Eugenol.—Eugenol or eugenic acid is a pure extract from cloves, and its properties are powerfully narcotic when locally administered.

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In dentistry it is useful in relieving pain in a carious tooth or when the dentine is painfully sensitive during excavation.

Tropococaine.—Tropococaine hydrochlorate is a substitute for cocaine and considered safer than that drug and equally effective. Anæsthesia is of longer duration and hyperæmia much less than after the use of cocaine.

Orthoform.—Orthoform, a preparation of acidum salicylicum, has both antiseptic and anæsthetic properties, but its application is rather palliative than curative. It relieves pain of wounds and allays the suffering from burns. As an operative application it is not useful, as it is not thoroughly able to prevent feeling in parts to be operated upon.

There are some minor yet important local anæsthetics that I will mention, having tested them in numerous cases.

Chloral hydrate.—Chloral hydrate is peculiarly effective in the temporary relief of hæmorrhoids and other rectal pains, if used in small quantities, while larger applications are followed by general narcosis.

Carbolic acid.—Injections of a weak solution of carbolic acid into painfully inflamed hemorrhoidal vessels sometimes gives temporary immunity from the pain.

Water Hypodermically.—The hypodermic injections of distilled water is found quite effectual in the immediate though transitory relief of local or general pain. This is due to the pressure of the water upon some of the peripheral nerves and not to any real anæsthetic or curative power in the water.

There are many remedies which, though not strictly curative are yet quite useful in alleviating pain, by injection, as in hæmorrhoids or by direct application to ulcerated surfaces. These are the opiates, chloral, cocaine and similar drugs. Though they are not useful in surgical operations, the palliative influence they possess gives rest to overtaxed nervous endurance.

I have said nothing of hypnotism because of its producing general, instead of special, local effects.

Anæsthesia by Cold.—Another form of local anæsthesia is produced by applications which cause extreme cold, sometimes called the "freezing process." It is generally produced from spray formed by putting the drug into a bulb and directing the spray from it upon the parts to be operated.

It can also be produced by the application of ice, or salt and ice mixed and applied directly to the part, contact being retained from one to two minutes, when the sensibility to pain will lie briefly suspended.

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Chloride of Ethyl.—Chloride of ethyl is considered an excellent local anæsthetic; it is furnished in glass tubes hermetically closed. When required, the small end of the tube is broken off when the warmth of the hand will force the liquid in a very fine stream upon the surface to be frozen. This is very useful in short, superficial operations, such as opening abscesses, removing small tumors, cutting out foreign bodies, stitching lacerated wounds. I have found Dr. Bengue's patent spray and stopper very convenient. It comes all ready for use in a neat case, very convenient for pocket or medicine case.

Rhigolene.—Rhigolene, a very volatile product of petroleum, is also very effectively used in producing local insensibility to pain. It is used as a spray by forcing it from the bottle by means of a bulb and tube with perforated nozzle. This is very useful in short operations, and was once regarded with great favor in extracting dentistry, but it has long since been abandoned.

Cymogene.—Cymogene is a drug nearly isomeric in its action with rhigolene though I have abandoned the latter and now chloride of ethyl is my preference, as I have used it with great satisfaction.

Menthol.—Menthol, oil of peppermint, can be applied to the surface with a brush or used as a spray. It is very benign in relieving pain by both outward application and internal doses. It relieves neuralgia and rheumatic pains when they are superficial or peripheral, and one or two eminent physicians affirm that it can control incipient or even slightly advanced inflammation without any subsequent return of the attack to the surface treated.

Eucaine.—Eucaine, alpha hydrochlorate, resembles cocaine in its action, but is intended specially for application to mucous surfaces.

Eucaine, beta hydrochlorate, also analogous to cocaine in its effects, is recommended in ophthalmological research, but it often causes a burning sensation when applied to the conjunctiva.

Holocaine.—Holocaine hydrochlorate is another companion to cocaine, and is recommended for treatment of eye inflammations. These three preparations being so nearly allied to cocaine that I do not use them, feeling in every way fully satisfied with my standard ophthalmological assistant drug, cocaine itself.

Guethol.—Guethol, guaiaco ethyl, is considered as an antitubercular agent, taken either externally or in internal doses. Its action is much like that of guaiacol.

That there may be counter results in the use of any preparation of cocaine, no one of experience will gainsay. Experience is ever the best

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teacher, and I doubt not that every practitioner who has resorted to any mode of anæsthesia, whether local or otherwise, has found certain peculiar effects in the action of each upon individual cases. All will agree with me that a thorough diagnosis of the general physical condition of a patient is necessary before applying anæsthetics, even for slight operations.

It is a well known fact that creosote and its numerous concomitants will preserve flesh, but a careless administration of any of them will more rapidly destroy fibre and tissue beyond repair.

Even in the use of cold producing agencies, particular care must be practiced because the intensity of the freezing process, if not limited, may cause subsequent inflammation and sometimes sloughing of the tissues that have been destroyed by the prolonged application of the cold-producing agent.

There has been considerable discussion regarding the true action of these freezing drugs, some claiming that the cold is the result of very rapid evaporation. Doubtless in several drugs this is the case, but menthol, ethyl and such extremely pungent drugs have a property peculiar to themselves, which, though transient in effect is strikingly analogous to the results procured by the spray application of other preparations.

That time may be saved I will give a summary of the remedies herein mentioned with their antidotes and the quantities usually administered; taking them alphabetically for further convenience:

THE MYDRIATICS.

Atropine, usual quantity, one drop of solution of one part sulphate of atropine to one hundred and twenty parts water. Antidotes, before absorption, charcoal or tannin; after, emetics, pilocarpine, muscarine nitrate or morphine by hypodermic injection. The physiological incompatible drugs are the three mentioned, aconite and muscarine. The chemicals are salts of mercury, tannin and the alkaloids.

Cocaine, hydrochlorate, usual quantity, solution two to five per cent. Antidotes, ammonia, digitalis, alcohol, chloral, caffein, amyl nitrate or morphine-hypodermic.

Daturine, nearly analogous to atropine; quantity, one to one-hundred and sixty thousand per cent. Antidotes, same as atropine.

Duboisine sulphate, quantity—0.2 to 0.8 per cent. solution for eyes. Antidotes, same as atropine. This drug is hypnotic and sedative. It

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comes as a yellow powder, deliquescent and soluble in alcohol.

Gelsemine, quantity—seldom used. Small white crystals, soluble in ether, chloroform or alcohol. Antidotes are in early stage emetics of either atropine or strophanthin, external stimulants and artificial respiration.

Homatropine hydrobromate, quantity—one per cent. solution or stronger for eyes. Small white crystals, soluble in 133 parts alcohol, in 10 parts water.

Hyoscine hydrobromate, quantity—one drop of solution of one to three hundred. Perfectly transparent crystals soluble in either alcohol or water.

Hyoscyamine, silklike white crystals, soluble in either chloroform, water, acidulated water or alcohol. This drug is not only sedative but hypnotic. Its antidotes are the same as for atropine or daturine. Quantity same as hyoscine.

Muscarine, sulphate and muscarine nitrate are practically about the same. (Merck.) This appears in a deliquescent mass of brown color. soluble in either alcohol or water. It is antispasmodic, antihidrotic and is used also in treatment of incipient diabetes and night sweats. This is one of the principal antidotes to atropine, daturine and hyoscyamine. Dose 1/32 to 1/16 grain.

Mydrine, quantity—ten per cent. solution for eyes. It is a white powder soluble in water, not dangerously toxic (?)

Scopolamine hydrobromate, quantity—one-tenth to one-fifth per cent. solution for eyes.

It is a colorless hygroscopic crystal, soluble in alcohol or water. Antidotes, stomach pump, emetics, tannin, muscarine, charcoal (animal) cathartics and other heroic remedies.

MYOTICS.

Arecaline hydrobromate, quantity—one per cent. solution in ophthalmic examinations.

It comes in pure white crystals soluble in either water or alcohol.

Eserine, physostigmine salicylate, quantity—five per cent. solution for eyes.

It is a yellowish crystal, soluble in 150 parts water, which solution turns red after a short time. Besides its myotic influence it is used in tetanus, toxic convulsions, strychnine poisoning and in relief of spinal depression.

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Morphine, a crystal, is almost insoluble in water. It is seldom used as a myotic except as antidote to atropine, daturine, etc., or through hypodermic injection. Antidotes, heroic emetics, stomach pump, permangnate of potash, picrotonin, atropine, paraldehyde, strychnine, cocaine, caffeine, violent exercise, electricity. Its incompatibles are the alkalies, potassium permanganate and kindred drugs.

Opium, much the same as morphine, used in ophthalmic research more as antidote to antagonistic drugs.

Muscarine nitrate, antidote to atropine, contracting pupils.

Pilocarpine hydrochlorate, as a myotic and antidote to atropine. Quantity—one drop of solution of one to one thousand or twelve hundred. As a remedial agency it is sialagogue, diuretic and diaphoretic, being used in doses of one-eighth to one-fourth grains in water to be administered either by the mouth or hypodermic injection. The maladies so benefited are coryza, bronchitis, asthmic dyspnœa, laryngitis, croup, pneumonia, uremic convulsions, the maximum dose at any time being one-third grain. Antidotes, emetic, stomach pump, ammonia, atropine, brandy, etc. Its opposite drugs are alkalies, iodine, nitrate of silver, and corrosive sublimate.

LOCAL ANÆSTHETICS.

Camphor, monobromated, quantity—two to five grains in emulsion or pill, the latter being objectionable because of its insolubility in the stomach.

It is a beautiful semi-transparent crystalline gum, soluble in oil or alcohol, but slightly so in water. Its order is pungently aromatic and fragrant, its taste peculiarly cool, slightly bitter, and the mass is quite volatile, disappearing without residuum when exposed to the air. It is diaphoretic, sedative and narcotic, and as a local anæsthetic rather soothing and narcotic than in any manner a true anæsthetic. Antidotes, emetics, opium, morphine.

Cocaine hydrochlorate, quantity two to five per cent. solution. Colorless crystals soluble in alcohol and water. Antidotes, amyl nitrate, morphine, caffeine, chloral, alcohol, ammonia, digitalis.

Creosote, is a colorless oily fluid with disagreeable odor, greasy to touch, inflammable and destructive to skin. It mixes with water or alcohol, the solution turning red on exposure for any time or even when not exposed to light if kept long. It is antiseptic and palliative rather than truly anæsthetic in its action, being used to allay toothache and

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other acute pains. Antidotes, alkalies, milk. But beechwood creosote has very little, if any toxic qualities, and it should be the only kind used except in rare cases for outward application. Merck, in his manual, says, "Wherever creosote is indicated for internal medication, creosote from beechwood should be dispensed and under no circumstances should 'creosote from coal tar' be given, unless explicitly so directed."

Wood creosote and coal-tar creosote differ very widely in their action on the human body; wood creosote is comparatively harmless; while coal-tar creosote is decidedly poisonous. Merck's beechwood creosote is absolutely pure and free from any coal-tar poison.

Ether spray, used externally only. Spray from ether, sulphuric acid or ether fortior. Not poisonous thus used.

Ethyl chloride spray, outward application only. A colorless liquid soluble in alcohol. Used in dental surgery and in minor operations. It also relieves neuralgic and rheumatic pains. Non-poisonous but highly inflammable, and most efficacious if held from six to ten inches from surface to be frozen.

Eucaine, for local anæsthetics, sub-cutaneous six per cent. solution. White powder soluble in water. Antidote same as cocaine.

Eugenol, eugenic acid, local anesthesia in dentistry particularly. Used externally also for eczema and other cutaneous eruptions. It is a colorless oleaginous liquid with spicy odor and pungent taste, soluble in alcohol, chloroform, ether or a solution of caustic soda. It is antiseptic and antitubercular, applied outwardly.

Erythrophleine hydrochlorate, a colorless crystal soluble in acetic ether, water, alcohol and amylic alcohol. It is narcotic and astringent, producing numbness in the spot affected by it.

Guaiacol—externally applied pure, with glycerine or with oil. It is a clear colorless liquid with aromatic odor, soluble in alcohol, ether, or two hundred parts water. It is considered antiseptic, antitubercular and antipyretic. It is analgesic and antipyretic in external use. Not actively poisonous.

Guethol, ethyl, used particularly as substitute for guaiacol. It is an oily liquid, easily affected by cold, soluble in alcohol, ether or chloroform. It relieves the pains of neuralgia, tubercular cystitis and other local diseases, used with a brush after mixing with chloroform or in ointment of ten to twenty per cent. guethol.

Holocaine hydrochlorate, used as an anæsthetic in the same manner as cocaine and eucaine. It is furnished in thin white needle-like crys-

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tals, soluble in forty parts water. It is also used in diseases of the eye in one per cent. solution.

Menthol, used in outward therapy as a freezing or deadening agent. It is a greenish colored oil, very pungent and aromatic and immediately upon application, either external or upon the tongue, there is a peculiar sensation of cold. It is soluble in equal parts of alcohol, but crystallizes conveniently. One crystal placed in the cavity of an aching tooth produces first a very acute pain, which instantly yields to the extreme cold and gives quick and sometimes permanent relief.

Methyl chloride, oil of wintergreen, almost isomeric with menthol in its action. Colorless liquid with chloroformlike odor.

Orthoform, methyl ether of para-amido-meta oxybenzoic acid. White inodorous powder, slightly soluble in water. Applied pure or in ointment or trituration for the alleviation of painful wounds and burns. It is palliative, antiseptic and can be used internally as an anodyne.

Tropacocaine hydrochlorate is a clear crystal soluble in water, used in place of cocaine, eucaine and holocaine. It is claimed that anæsthesia is of longer duration with this drug than any of its substitutes, and its effects are less injurious to the system. As a local anæsthetic the duration of its power renders superficial and minor operations possible.

ANÆSTHESIA BY INFILTRATION.

The possible difficulties attending total anæsthesia has always been the source of much study and research. Resulting from this we have local anæsthesia by outward application, by spraying and by sub-cutaneous injection. There is still another mode of producing immunity from pain by infiltration, a certain quantity of plain water forced into the tissues being able to render the part momentarily insusceptible. A solution of cocaine, morphine and salt water will produce œdema of still longer duration; these results being caused by the pressure of the foreign fluid upon the nerves, and by the action of the drugs upon the nerves, if any drugs are employed the latter being responsible for the greater duration of the anæsthesia.

An eminent physician and surgeon gives the following formula as a superior agent for anæsthesia by infiltration, Cocaine Hydro. gr. iss. Morphia Hydro. gr. ⅓. Sodi Chloridi, gr. iij. Aqua. ℥iijss. This to be first injected into the skin, and then into the tissue to be rendered insensible. Doubtless any and all of these modes of preventing or relieving pain have each their valuable properties, as also has the

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administration of nitrous oxide gas in the extraction of teeth. But there are so many considerations to meet that there can be no better plan than for every physician, oculist and surgeon to make careful studies, not only of the drugs but of the individuals upon which they intend them to operate: for where one may be harmless to a certain case it may cause serious complications in another. I have ascertained that there are very few drugs that are altogether and universally harmless. Not because of their special properties always, but in their relation to the systems upon which they are employed. Therefore it is the bounden duty of the profession to take every precaution in the diagnosis of each case under his practice and to use the most benign as well as the most accommodating remedy.

DISCUSSION.

Dr. Keeler: The wonderful advances made in the ophthalmological field during the past decade are most admirably suggested by Dr. James' paper.

The doctor has done more than to present for our instruction this very complete list of mydriatics, myotics, and anæsthetics; he has given us in the fewest possible words their dosage, characteristics, and comparative values. His paper might with propriety be termed a "comparative materia medica" of the drugs named. The subject has been most ably handled, and in the discussion I only hope to make emphatic some few points.

To prove that the work of the oculist is scientific, we must show that thoroughly effective work is being done by us. This is the true test of success. In order that we may accomplish effective work we must use drugs with which we are not only familiar, but upon whose results we may place implicit confidence. With "perfection as the goal" we have neither time nor inclination to become "faddists." We must not be too ready to try experiments. Some ambitious pharmacist assists a new-born drug into the medical world every day in the year, and in the majority of instances had there been a miscarriage the world of therapeutics would not have been the loser. For each of these new-comers a brilliant future is predicted; we are all expected to give them a thorough trial in our practice, and the result in the great majority of cases is that within six months we are using the old remedy, tried and true, or have been induced to discard the new for one still newer. One of the best therapeutic rules with which I am acquainted is

"Be not the first by which the new is tried,
Nor yet the last to lay the old aside."

Among those drugs comparatively new cocaine must be credited with altering the whole professional life of the oculist. It has proven

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itself invaluable. As Dr. James has intimated, it should not be used without judgment. A great number of deaths have been reported following its use, in some cases almost instantly, but they are mainly where a large amount has been injected hypodermically or a strong solution used locally. The smallest fatal dose recorded is where two-thirds of a grain was injected into an eye, with the result that immediate unconsciousness followed, and death occurred in two hours. One grain injected into the gums by a dentist produced death in a few minutes. The application of a 10 per cent. solution to the larynx with a brush was also fatal, unconsciousness following almost at once, and death in three hours. Also cases have been reported where the instillation of a 6 per cent. solution into the eye have been followed by an alarming depression, unconsciousness, and delirium.*

When a few drops of a two to four per cent. solution of cocaine will enable the operator to accomplish everything necessary, the query at once arises: Why use a stronger solution capable of possible harm?

Also when cocaine is so uniformly satisfactory when properly used, why the anxiety to find something to supplant it? I doubt not that to all of us it is, as has been expressed, our "standard ophthalmological assistant."

As has been recently pointed out,* it may be abused by physicians who forget the injurious local effect of cocaine upon the nutrition of the cornea. In cases where it has to be applied for a considerable time, as in conjunctivitis, corneal ulcers, and other forms of eye pain due to inflammation, it becomes decidedly hazardous. The practice is common among general practitioners to prescribe a solution of cocaine for almost any eye pain. When used thus for any considerable period of time it causes dryness of the cornea, and looseness of the epithelium. Not only is there this danger, but its application deceives the physician by creating the impression that a very serious condition may be trifling, because the pain is removed. Indeed, I have found that so generally has the fact become known that cocaine will relieve eye pain, that the laity frequently will resort to its use.

Orthoform has been used with flattering results in some cases where cocaine has proved of little or no value.

M. Boisseau reports that in several instances he has secured relief in ulceration of the cornea, with intolerable pain, photophobia, and lachrymation, by the use of an ointment composed of six grains of orthoform and one dram of vaseline. And the fact is recorded that the painlessness continued for some twelve hours.

Other cases are reported with results as above outlined. The conclusions drawn are that orthoform is perfectly inocuous, even when its employment is prolonged, and that it possesses remarkable analgesic power in diseases of the eye where cocaine has little or no effect.

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* A. R. Baker, M.D. in *American Journal of Ophthalmology.*

* "Southwestern Record," Vol. 4, p. 80.

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Dr. James' opinion as to the value of homatropine has been emphasized in my practice. I have also had the best of results from the use of duboisine. With either of these drugs we get the full mydriatic effect in an hour, and the patient is enabled to resume his usual avocation in as short a time as with any other mydriatic with which I am acquainted.

Dr. F. P. Warner: Is it safe to use cocaine? While I have not had any bad results from cocaine, yet I have had quite a few cases where my patient has become faint and I have had to stop using it, and allow them to lie down for a time. I think now I can judge pretty well of my patients, where I can expect to have good effects or be on the lookout for ill effects. Those cases that do not bear it well are the thin, anæmic individuals, not especially those who have any difficulty with their hearts, but those who are bloodless, or highly nervous. In this class of cases I am always on the lookout about using any strong preparation of cocaine. I have never seen any fainting occur in plethoric people, in strong, robust individuals, or in children. I think a 4 per cent. solution sufficiently strong.

Dr. Bates: About ten years ago I was called to see a very bad case of iritis in a man sixty years of age. He had been for six weeks under the care of an allopathic oculist of two or three years' experience. The oculist had suggested an operation as a last resort, and wanted counsel. He would not have me, as I was a homœopath, but wanted to send to Toronto for a specialist of his own school. The patient objected on account of the expense, and the case came into my hands. I took in the situation. The doctor had used atropine; symptoms of glaucoma had then been set up, and he had used eserine. He then thought the only resort an iridectomy. He evidently did not know that while atropine increases the tension, some mydriatics do not. I put hyoscyamine in the place of atropine, and tension diminished and patient got well.

Dr. Boynton: I wish to take exception, with all respect to Dr. Bates, to his statement regarding the influence of mydriatics over tension. Any mydriatic, except, possibly, scopolamine, increases or augments intra-ocular tension. It is a perilous thing to dilate the pupil with any of the drugs given where the balance between the secretions and excretions is delicate. With your permission we come back to the old stand-by, atropine, the standard mydriatic for paralyzing the accommodation, and for inflammatory conditions; but I am afraid of it in cases past middle life, where the tension should be carefully taken, and if there is any augmentation or tendency for it to increase the atropine should not be used. Scopolamine is probably the safest mydriatic, and, so far as we know, is not followed by increased tension. It has been used steadily and systematically in cases of glaucoma in the ophthalmic hospital, and I do not know of any case where the tension has been increased when used in one-quarter of 1 per cent. solution. The one-half per cent. knocks them out. It is just as paralyzing as that other solanæ, hyoscyamine, with which

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it is almost identical, but it does not produce so much paralysis of nerve centers as this last drug. I am using a one-quarter of one per cent. solution, which is strong enough to paralyze the accommodation in an hour, and satisfies me as to the amount of refractive error, helping me in the selection of a suitable glass. I think it is the best mydriatic known, except for inflammatory conditions.

Dr. Deady: I am obliged to take exception to some remarks of the last speaker. I have used atropine in the New York Ophthalmic Hospital and a limited private practice for twenty-three years, with the exception of the last five years, during which time I have not used it at all. In my opinion scopolamine is superior to atropine in health and in disease as a mydriatic for any use to which a mydriatic can be put. I have tested it in my clinics side by side with atropine on the same cases and on different cases. The 1 to 200 solution of scopolamine used once would paralyze in an hour the accommodation considerably better than atropine would do it. I have had the same case use atropine, and when that had passed off in a week or ten days, used scopolamine and have found the refractive anomaly greater and have seen the second drug go deeper into the case. I did that on case after case in our clinic four or five years ago, when the drug first came out. I have never seen any dangerous action from a one-half of one per cent. solution. Dr. Boynton states that he has. That is a matter of the personal equation. Although I have never seen anything dangerous from the 1 to 200 solution I can very easily imagine that dangerous symptoms could arise, though I have never seen any such effects from either homatropine or scopolamine. In one case of glaucoma I had remarkably beneficial effects from scopolamine—a case in which we tested the drug freely. With eserine the tension would gradually rise, but by the use of scopolamine it would come down gradually in twenty-four hours or less. We did it repeatedly. I had another case in which the result was not so emphatic, but the general result was the same. My impression is that scopolamine, except in rare cases, is not a drug for glaucoma. It is perhaps the least dangerous drug to use for mydriasis, for the reason that it is least apt to produce glaucoma; but I think, with a tendency to glaucoma, which we cannot know in advance, any drug which dilates the pupil may precipitate an attack at any time. My experience with scopolamine (and it has been a very large one for the last three or four years) has made me think it the best all-round mydriatic that we can use. Homatropine I have no use for—it does not go deeply enough. Dr. Boynton's statement that we get all necessary aid from homatropine or atropine in the prescription of glasses, I differ from, in that I think that the use of a mydriatic of the most profound character is of the first importance in these examinations. It is not the hyperopia that we want to get at, it is the exact degree of astigmatism—the exact axis. I have seen a change of 5 degrees in the axis of a lens of the strength of a quarter of a diopter plus, make all the difference between happiness and misery on the part of the patient.

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Dr. Anderson: Since my one experience with scopolamine I have been very chary in its use. Perhaps this case was one of those unfortunate susceptible ones, but for about five or six hours I was exceedingly anxious. I called in consultation an allopathic neighbor living next door, and we worked over this case I think about five or six hours before we thought he was out of danger. I used scopolamine in about the ordinary strength in this case, and for some time afterward I did not use it at all, but I am going back to its use again now.

Dr. Boynton: Was it a one per cent. solution you used?

Dr. Anderson: Somewhere along there, perhaps; I am not just sure. I have had very satisfactory results from scopolamine as a mydriatic, using it since that experience very carefully.

I have found the use of *Gelsemium* a preventive against the poisonous effects of cocaine; and, if I see any marked poisonous effects coming on, I give them in addition inhalations of amyl nitrate of about 10 per cent. strength in alcohol and let them inhale it. By this means the poisonous effects of cocaine pass quickly away.

Dr. Suffa: When scopolamine was introduced into ophthalmology it was claimed for it that it would not produce or precipitate glaucoma. I have seen two cases where decided hardness of the eyeball was brought about, and in one case very intense increased tension. In one-half of one per cent. solutions I have noticed toxic effects in probably 50 per cent. of cases, vertigo, staggering gait, paleness and nausea. In one-fourth of one per cent. solutions toxic effects are small, but still more than desired. It has failed to paralyze the accommodation in several cases, and that after their instillation twenty or more minutes apart.

Dr. Deady: Who made your solutions?

Dr. Suffa: The solutions are obtained at large drug-stores; the same solutions producing the proper actions in subsequent cases.

Dr. Norton: I wish to thank Dr. James for his most excellent digest of the subject, and for having brought out a most interesting discussion. I wish to add a word of warning as to the use of scopolamine. When the drug was first brought before the public it was claimed that it did not increase tension. This statement was evidently untrue, as since then quite a number of cases of glaucoma have been reported by competent observers as having been caused by scopolamine, and in proportion to its frequency of use as compared with atropine, I believe it to be as fully liable to cause glaucoma as is the latter drug. Glaucoma is supposed to be due to the mechanical obstruction of the filtration passages. I believe the best authorities to-day claim that any drug causing an equal amount of dilatation or pushing the iris over into these filtration passages is equally liable to cause glaucoma. I think the statement that scopolamine does not increase the tension is wrong, and a very dangerous one to make.

Dr. Vilas: I dislike to differ from my friend, Dr. Boynton, but I wish to add a word on the use of atropine. I do not doubt but that he has had the experience that he stated, as there seems to be a certain

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number of cases that will result badly under the use of atropine; but I have used it many years with no serious results. I have tried the other drugs mentioned, but still prefer atropine, believing that it is the most reliable of these remedies. But it should be used on persons of, say, forty-five years and upwards with great caution.

I never allow a patient to use it the first time, and I never allow my patient to go away until I am satisfied that the effect is good. I have seen bad effects from daturine, but never serious ones. Summarized, I believe if care is exercised in the use of atropine that, though unfortunate results occur, it is the best remedy of the kind that we have at present.

Dr. Moffat: I am disappointed in this paper; I had hoped to learn from it and its discussion the relative effects, merits and dangers, indications and counterindications, of these remedies. I understand the disadvantages of cocaine are: dangers of constitutional poisoning, and of dessicating the cornea even to exfoliation.

That holocaine is more painful but does not dilate the pupil, while it is free from the above dangers; that eucaine B. can be sterilized; I know of no objections or limitations to its especial use.

I have not been able to make up my mind about the effect of scopolamine upon tension; have used it satisfactorily in place of atropine.

I would choose atropine if I wanted the patient to have belladonna —and were not afraid of glaucoma; but would be on my guard against it in the latter case and also on "belladonna patients." I have had one death following cocaine: A plethoric old Englishman, apparently healthy, came into hospital a couple of days before operation—extraction of cataract. This went off smoothly under formalin antisepsis; four drops of 4 per cent. cocaine mur. solution were instilled at five minute intervals, and another drop during the operation after the corneal incision. Upon sitting up to get off the table his face became very red, but he said: "I am all right." Two hours later he developed acute mania, from which he died in a couple of days; autopsy showed intense cerebral hyperæmia and congestion of the circle of Willis. He had been deprived of alcoholic stimulants, which he had been accustomed to take daily. This was doubtless the main factor in the case, but to my mind he had marked secondary action of cocaine as an exciting cause.

I understood the writer to recommend eserine to the eye if cerebral symptoms develop from a mydriatic; this does not appeal to me as rational. If we want to constrict the dilated cerebral vessels antipathically I do not believe this the best way to go at it; first, will eserine so act in the brain? Second, how much must we drop into the eye to get other than merely local effects? As Homœopaths we have scientific remedies for cerebral hyperæmia, or anæmia caused by drugs as well as if the conditions were idiopathic. Medicine can be just as homœopathic in large as in small doses, in its primary as its secondary action.

Dr. Hooker: It is exceedingly common to have patients turn pale and faint in the examination of the head or the chest, inspecting the

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ears or examining the eyes, or in merely examining the nose. It is especially common for young and scrawny, thin-blooded people to turn faint during slight operations. I think we should discriminate between the faintness which occurs under those conditions, and the faintness which is supposed to come from cocaine. I find two effects from cocaine: the first is, stimulation like coffee, the brain is more active, the patients are to some extent garrulous and talk to you in a free way that they would not do when not under the influence of cocaine. Another effect is in the direction of drowsiness—they become drowsy and stupid and feel numb. I thing the cold sweat, the weak pulse, and fainting are not the effects of cocaine. I think it is simply the faintness which is induced by being examined and by going through the operation; and I believe it very probable that many of the so-called poisonous effects which are attributed to cocaine are not due to the drug at all.

Dr. Linnell: It seems to me the way in which we use these drugs is important. I have used scopolamine a great deal with satisfactory results. I drop a very little on the upper surface of the cornea, allowing it to trickle down over the surface; at the same time I incline my patient's head toward the opposite side and close the tear passage. I think a little precaution of this sort will avoid the danger. I have had a somewhat similar experience to that mentioned by Dr. Suffa: that is, scopolamine has sometimes failed to paralyze the accommodation, which I have attributed to the solution being perhaps a little too old. I would like to ask Drs. Boynton or Deady whether they find it decomposes rapidly, and how long a solution should be kept before being renewed.

Dr. Boynton: You have all had failures in the use of mydriatics. From idiosyncrasy you have seen alarming cases of poisoning, even from the instillation of ½ per cent., a quarter or even a fiftieth per cent. solution of atropine. One case occurred under my observation within three weeks, where a woman of 25 years with progressive myopia, which had alarmingly increased recently. I had had her under observation since she was ten years old, and, finding an alarming increase after an absence of several years, one drop of atropine was used. She left after being an hour in the office, and did not reappear for a second examination. Instead, a note from her physician said she was alarmingly ill from atropine poisoning. I never use a mydriatic without pressing on the tear passages. I must have done so, although I do not recall positively, but as it is my rule, I presume I pressed on her lachrymal sac and prevented the passage of the tears into the nasal passages. That woman was violently ill, with delirium and eruption in the fauces and over the body, and prostration, for more than four days from one instillation.

Some years ago the Ophthalmic Hospital had its solutions made up by the students, who acted as apothecaries. I used then to have almost every case of delicate women and men where scopolamine, supposed to be ½ per cent., was used, suffer from prostration, vertigo,

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and disturbance of equilibrium. I am aware that they used to substitute hyoscyamine for the scopolamine, which is a stronger paralyzer and disturber of equilibrium than the scopolamine. We now have a regular pharmacist make up all the solutions of the mydriatics used, and have absolute accuracy, so far as we can get it. I have adopted the ¼ per cent., which I think is strong enough, while the ½ per cent. is dangerous.

Dr. Harvey: No one having mentioned in this discussion the minimum dose of scopolamine that will produce complete paralysis of accommodation, I wish to say that in children under ten years I use a $^1/_{20}$ of one per cent. solution, two drops in each eye at intervals of fifteen minutes, and for those over ten years a $^1/_{10}$ of one per cent. solution in the same manner. It never produces toxic symptoms, and has never failed if the solution is prepared fresh every four weeks.

Dr. James: I feel amply repaid for the work I have put in upon this paper. I put it in purely as a sort of firebrand, and am glad it roused up some little disturbance in the society in the way of debate. I have obtained just what I wanted, and that is the consensus of opinion of the members of the association on these agents. The paper has brought out the experiences of many of the members of the association, and of the profession in our school, and I am very glad to have all these thoughts in regard to these agents. We have to constantly use them, remembering that they are dangerous. There are patients that are extremely susceptible to the use of any and each individual remedy named, and we are going to find out, by throwing out these ideas, just where the danger lies. I remember a case that occurred several years ago—a very stout man subject to attacks of inflammation about the face—localized erysipelas, and sometimes the whole side of the face would be affected. He was very susceptible to *Rhus tox.*, and the symptoms were very acute. He told me of this susceptibility, and that he had been poisoned with it several times. He said: "You will please not give *Rhus* in my case." His symptoms one day were so thoroughly *Rhus* that I thought I would take my own judgment and not his. I gave him a dose of *Rhus tox.* 30x. The next day when I went in he said to me: "You gave me *Rhus toxicodendron* yesterday, and I told you never to give it to me." He said: "I now have all the symptoms of *Rhus tox.*" The preparation was made by Boericke & Tafel, and I presume it was truly the 30th. That is the effect of one remedy upon one man, and we all have seen similar susceptible effects of these mydriatics on individual cases. I have time and again insisted upon the peculiar temperaments of individuals being taken into account—that we must individualize the temperament in selecting every remedy that we use. We have to in the application of the Homœopathic remedy to symptoms, so we certainly ought to do so in any mydriatic, myotic or other such remedy of this character, which is known to be poisonous in its general action upon the system. We apply them simply for local use. We do not expect to get general symptoms from them at all, but in temperaments of a peculiar char-

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acter we do get the general symptoms. We ought to look out for that. We get poisonous symptoms that we do not want in individual cases, and yet in those individual cases I do not see why we should not use these local special remedies in specialty practice. You take the case of chloroform. Certain individuals will die under its use, yet the next 10,000 cases will not.

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SOME CASES OF CARIES OF THE EXTERNAL AUDITORY CANAL.

By Howard P. Bellows, M.D.,
Boston, Mass.

THERE is a class of cases, which is relatively common, which presents a carious destruction of a portion of the superior wall of the external canal, close to Schrapnell's membrane. These are chronic suppurative cases with much destruction of tissue, including not only the drum-head but also the loss of the malleus and incus. The carious process may have reached the canal wall, originally, by extension from a carious spot upon the neck or head of the malleus, communicated by the contiguity of the parts. It is not my intention to cite any cases of this class because they are too common. We have all had them and to write of them would be wasted time.

Case One.—Related to them, but of more interest, is a case which I have now under observation. The ear has discharged, at intervals, for seventeen years, following measles. The drum-head is not absent but is very cicatricial; with broad adhesions to the promontory of the tympanum, and the hammer strongly bound in cicatricial tissue. In the superior wall of the canal, just exterior to Schrapnell's membrane, is an irregular carious opening, which admits a view directly into the attic space when the head is strongly flexed towards the opposite side. The discharge is very variable, sometimes nearly absent and at other times profuse, bloody, and even offensive, coming at present, of course, from the attic and the adjacent bone. The variation is due to the degree of carelessness on the part of the patient in cleansing the ear. This young man managed to elude the military examiners and enlist in the army at the beginning of the recent war. He saw service in Porto Rico and was altogether happy until there was no prospect of further fighting. When that time arrived he allowed his disability to be discovered by his regimental surgeon and promptly received his discharge. It is to be hoped that his adventurous spirit will not lead him to "take chances" with this disease.

Case Two.—Another case with caries in this same region is that of a young man whose drum-head and ossicles are intact. There is no history of suppurative disease of the middle ear at any time. This case first came under my observation nearly fourteen years ago. There was then an otitis externa diffusa with a polypus dependent from the superior wall of the canal near the drum-head. There was absolutely no perforation-sound, nor tympanic râle of any sort, upon catheterizing,

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and I had no reason at the time, or afterwards, to suspect the middle ear of complicity. I removed the polypus and restored the external canal to an absolutely normal appearance in three treatments, covering about six weeks time, the patient living at too great a distance to come more frequently. After a lapse of four years the patient again came to me and I then had his ears under observation and treatment, at intervals, for a term of about three years—the condition upon both sides being simply catarrhal. At the end of this time there appeared a small, dry scab upon the superior wall of the left canal, at the point where the polypus had existed seven years before, near the margin of the drum-head. This scab I removed. Six weeks later I found slight moisture at that point, and five weeks after that the patient presented himself with a gelatinous discharge and small polypus. The local use of a boric acid and alcohol solution, with *Calcarea carbonica* internally, corrected this condition in about a month's time, so that the polypus entirely disappeared and the canal became again hard and dry, and so remained, without further sign of disease, for three years and a half. He then presented himself with a discharge from the same ear again, which had continued for three weeks. Upon examination of the old spot I found two small polypi already developed. These I removed with a curette and directed the patient to again use the boric acid and alcohol solution, systematically, after careful cleansing. In five weeks he returned with the ear foul, through carelessness. I tried to frighten him and taught him how to cleanse his ear with hydrogen dioxid. A month later he returned with the canal dry but the diseased spot sealed in with a little hard crust. Removing this, with some difficulty, I found a slight accumulation of thick, greenish, offensive pus underneath, and my probe, entering the little bowl shaped cavity, readily detected carious bone. All this time the middle ear was not affected by any suppurative process. Although the carious spot enlarged I could never pass a probe into the attic space, but I could hook it outwards into the cancellous tissue between the lamellæ of the superior wall. The position precluded any forcible use of the curette except most superficially. For one year we worked away, therefore, as best we could, removing the cap which persistently sealed in the cavity, once or twice a month, as the patient could come to see me, and depending upon the hydrogen dioxide the balance of the time. As the patient became expert and thorough in the use of this agent the progress became more satisfactory, and *Silica*, given internally, seemed to be of further aid, so that for some months past the cure has seemed to be complete—the probe encountering only smooth, hard bone and no exudation nor any capping being present. The patient continues to come from time to time for inspection.

Turning now from the superior wall I would remark, in passing, that, in my experience, I have never known a single case in which the anterior wall of the canal has been affected by carious disease. With the inferior wall, however, the condition is not so rare. I will cite a case.

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Case Three.—The patient, a professional man of middle age and poor general health, with tuberculous tendency, had been under my treatment for chronic catarrh of the middle ear for about two years. There occurred at the end of this period a small ulcer on the floor of the external canal, just at its point of greatest elevation. There was nothing very marked in this. I cleansed and disinfected it and gave him *Silica* internally and at his next visit, two weeks later, it was apparently entirely healed, and so remained for about two months. At the end of that time I discovered at this same point, on the inferior wall of the meatus, a thin, dark colored scale. On pressure I fancied it felt boggy underneath and so I worked under its edge, elevated it and removed it entirely. My probe, with a sharp curve in the end, then sank into a rounded hollow in the bone containing a thick, cheesy secretion and on clearing this out the surface of the bone exposed was gritty and carious. This was curetted and hydrogen dioxid applied thoroughly. For four weeks the patient used this hydrogen dioxid daily at home and took *Silica* internally. Once a week I examined with the probe and at the fourth treatment found the bone hard and smooth and the trouble at an end. For nearly a year longer I continued to treat the catarrhal condition and there was no recurrence whatever of the caries. The patient then sought a more favorable climate for residence than that of New England and I saw him no more.

I do not know why this particular spot, on the floor of the canal at the junction of its inner third with its outer two thirds, where the elevation is greatest, should be especially liable to carious disease—unless it is that in efforts to cleanse the ear, or to allay itching or irritation, any accumulations which may be present in the canal would be pushed inward to about this point and there left to become a source of further irritation. A marked roughness of the bone at this particular point, which I have observed in a number of temporal bones which I have examined, would seem to favor the development of such a superficial condition, in certain cases, into one involving the deeper structures. Certain it is that, in my own experience, I encountered a second case very similar to the one I have just described—and not very long afterwards.

Case Four.—This patient had also been under my observation and occasional treatment, for a catarrhal affection of the middle ear, for a long period of time—nearly seven years in all. The canal had never exhibited any unhealthy state until, one day, I observed, in this same location on the inferior wall, an irritable and softened area of the skin. In the light of my former experience I carefully cleansed this and gave my patient *Silica*. A week later I again cleansed it and applied calendula cerate. At the end of a second week the spot was hard

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and dry and so remained for six weeks, at the end of which time, the hearing having come up to normal, the visits were discontinued. Eight months later, the catarrhal trouble demanded another course of treatment, and at my patient's first call I explored the site of the former local trouble to see if there had been any recurrence. I found small evidence of any on the surface, and my patient was conscious of none, but upon a careful use of the probe I got down through a softened spot to gritty underlying tissue. Opening up the surface I turned out a scale of necrosed bone from underneath. Curetting the cavity, cleansing with hydrogen dioxid, filling it with calendula cerate and giving *Silica* internally I found the healing apparently complete at the end of a week's time.

Case Five.—The most interesting case which I have to report in this series is one which involved the posterior wall of the external canal, establishing an opening, for a short time, into the mastoid cells, which were not diseased. The patient, a man about thirty-five years of age, thin, nervous, overworked and afflicted with chronic nephritis, came to me in a pitiable condition from the effects of pain, loss of sleep and the excessive use of opiates and whiskey.

Two years before a large bug had entered his ear. He filled the ear with water and did nothing further about it, although it never from that time seemed normal. For two weeks the condition had been getting more and more painful, with distressing autophony. For the past three nights the pain had been so severe that he had sought relief by deluging the ear with various mixtures, notably one of sweet oil, laudanum, aconite and chloroform; and had obtained no sleep except after heavy doses of opiates. Examination showed great tenderness of all the soft parts about the ear but none over the mastoid. The gentle removal of cheesy *débris* from the canal revealed a large mass of hardened wax. Further exploration brought to view a polypus on the posterior wall of the canal and a general condition of keratosis. Removal at one sitting was considered imperative, under the circumstances, and was accomplished, but with very great difficulty and the expenditure of a couple of hour's time; the patient often turning faint and having to rest and be braced up with hot bouillon. When the large mass was finally separated and removed it was found to consist of a mixture of wax and horny epithelial ribbons, and in the center of all lay the wing-plates, legs and various anatomical remains of the decayed bug, which had been the cause of the diseased canal walls and the whole painful condition. The odor of this mass, when it was opened, was sickening in the extreme. A week passed, in the treatment of this case, before the violent inflammation of the canal walls subsided sufficiently for me to attack the polypus. I then removed it with a ring knife, powdered the stump with aristol and packed the canal lightly with gauze. Three days later the spot was nearly dry. A week later there was a dry scab, but I found moisture beneath it. At the end of a second week there was the same dry scab, but under it a little point of fresh granulation tissue that aroused my suspicion.

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Exploring with a fine probe, bent at right angles at the tip, I discovered a small sinus, in carious bone, running through the posterior wall of the canal directly into the mastiod cells. The mastoid region itself revealed no sign of disease. After curettement and the daily use of hydrogen dioxide, with *Silica* internally, no further secretion was apparent after a week's time and my patient started upon a much needed vacation. Eight weeks later I found the ear entirely healed and sound, and the hearing distance 41/40. Six months have passed since then and I am sure the absence of news from this patient means good news, so far as the ear is concerned.

I am perfectly aware that this posterior wall of the canal is peculiarly liable to be affected by caries and to give way to an opening between the external meatus and the mastoid cells, but this process is almost invariably inaugurated from the inside, the products of inflammation within the mastoid process finding a natural egress in this manner.

Case Six..—I have recently had a case of this description which followed scarlet fever in childhood and exhibited, in conjunction with an empty tympanum, a large, irregular, carious opening in the posterior superior wall, through which one could gaze upon the cancellous structure of the mastoid cells, with the intervening cell walls white and glistening and totally devoid of their natural covering.

I have shown in this series of cases how the external auditory canal can be invaded by carious disease from either the attic of the tympanic space or from the mastoid cells; how such disease may originate in the canal walls themselves; how treacherous its development may be in this location; and how it may be successfully dealt with in its incipiency, before the degenerative process has become a serious menace to the patient or a permanent injury to the parts involved.

DISCUSSION.

Dr. Shearer: In reading Dr. Bellows' list of cases, one is struck by the fact that as all of his patients exhibited clearly defined caries of the external auditory canal, one should find so little mention made of this pathological state in treatises upon the ear. It is quite true that caries affecting the walls of the tympanic cavity and the ossicles are always described by writers on aural diseases; also caries involving the external auditory canal when secondary to diseased mastoid cells is referred to, but primary necrosis of the canal seems either to have been considered an impossible affection or one unworthy of a place in a text-book. By primary necrosis, I mean a condition which has not been in any way associated with changes in the middle ear, by a process of direct extension, from one part to the other. Personally, I

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am inclined to think that such apparently localized instances of necrosis must be comparatively rare. Possibly some cases are overlooked in the haste to examine the membrana tympani and when one is not expecting disease in such a locality, it is very easy for it to escape one's notice. The most interesting points in the paper are those concerning the site in which we may find the lesions, the simplicity of the treatment and the seemingly specific action of *Silica*. It is not unreasonable to believe that, underlying some cases of constantly recurring furuncular inflammation of the external auditory canal (and in which diabetes mellitus is not present), we may have at least a superficial tendency to caries of the subjacent bone. Women employ hair pins so frequently to dig at their ears that septic inflammatory processes are apt to occur on the inferior wall of the canal just at the point where caries is sometimes found—at the junction of the inner with the outer two-thirds. A sharp little finger nail is also capable, when repeatedly applied to the ear to relieve itching, of causing abrasion of the cutaneous layer in the canal and if persisted in, could readily, through infection, set up a carious process in the deeper osseous portion. In short, I believe that the majority of such cases of localized caries occur as the result of local irritation in people whose constitutional conditions are below par, such as victims of tubercular states or whose surroundings, bad food, poor digestions and generally diminished resisting power predisposes them to disease. Another point of great interest in these cases is the presence of a polypus in some and of granulation tissue in others. Now, in the year 1887, Briggs, referring to aural polypus, stated that "there is nothing peculiar in the nature of their origin, which is usually a suppurative inflammation. Histologically, they are primarily the same as wound granulations, except that occasionally they exhibit an epithelium which adds much to their growth. In the older polypi we find a mixture of granulation and mature connective tissue, the latter increasing with the age of the polypus. These growths are liable to so many accidents that large ones are seldom seen. Even in minute ones the microscope reveals degeneration of the tissue and extensive alteration in the blood-vessels. Granulation tissue preponderates, large round cells with large nuclei lying within a delicate alveolar framework. These cells are closely packed together with but little intermediate tissue. The transformation of the connective tissue begins in the axis of the growth, in the root first and extends outward. The most common form of degeneration is that of the myxomatous type. It is a good plan after the removal of either aural granulation tissue or a polypus, to explore for any evidences of caries, in the region from which such tissue has grown. If the underlying bone be diseased, reproduction of the growth is almost certain to occur. It is, of course, most important to ascertain as accurately as possible the condition of the middle ear in a case that presents signs of caries of the external auditory canal at any point. The chief charm in Dr. Bellows' paper is the clear cut narrative of each case, the concise yet complete descrip-

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tion and last but not least, the practical nature of the subject. It ought to afford us all an opportunity for deep reflection and study.

Dr. Shepherd: I have one case to report which may not have been primary caries of the canal, and yet may have been. About four months ago, a child of five years was brought to me. She had been sickly since birth, of scrofulous tendency, large glands, swelling of both knees, etc. The history of the ear trouble was very imperfect, parents being simply able to say that there had been a discharge from the ear only a few weeks. The appearance presented, when I first saw her, was like that of a canal apparently occluded by a tumor, which was very near the orifice and springing from the posterior wall. On pressure it seemed soft and I could distinguish marked crepitus. By passing the probe into the canal about one-quarter of an inch beyond the swelling, it came to the end of the skin and touched dead bone. By putting in a retractor and drawing out the skin-covering of the tumor, a button of bone, twice the size of a pea, was disclosed. This was removed with the forceps, leaving a hole directly through into the mastoid cells. Finding that the cells were themselves considerably involved, and the opening through the canal small, I laid the auricle forward and cleaned out the mastoid cells, which were entirely necrosed. The inner extremity of the posterior wall of the membranous and bony canals were perfectly healthy. Apparently the disease had not been a direct extension from the middle ear, even though a small perforation in the membrane showed that the tympanum was somewhat involved. The case, as far as the caries of the canal is concerned, has practically recovered.

Dr. Schenck: The relation of one of Dr. Bellows' cases where the necrosed spot was near the membrana tympani, recalls a case I treated last Fall with very satisfactory results in a somewhat similar position. The previous June she had a severe attack of suppurative otitis in both ears. The left ear, the one in which the necrosis occurred, had been almost useless as regards function since she was a child. The membrane was tough, and it had broken down with difficulty, the discharge continuing for the past three months, but not sufficiently profuse to attract her attention much. She had severe vertigo from the start, which persisted for several weeks so that she was confined to her bed. She was treated by her family physician, who did not recognize the case as aural vertigo from disease, and therefore treated her on general principles. It was three months afterward, when she was so that she could travel that I saw her. Curiously enough, she came to me not for the treatment of her ear, but for relief from a paralysis of the left side of the face and of the lower lid which made it impossible for her to close the left eye. After I inquired into this and found the vision perfect with almost no error of refraction and no intraocular disease, I told her I thought this paralysis was due to her ear and had nothing to do with the eyeball. Inspection revealed the canal one-quarter filled with very offensive pus, and near the posterior wall, at the junction of the membrane, was a spot covered

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with a small polypoid growth. It was some days afterward before I was able to get things in a condition so that I could remove the granulation. It was finally removed and the probe could then be passed two or three millimeters into the bone which was found to be rough and divided into small shallow cavities. It could also be passed into the attic. The condition remained about the same for several weeks, cleansing and antiseptic fluids having very little effect, and I had told her that I thought the only possible way we could get the necrosed bone removed from the facial canal where the pressure was apparently causing the trouble with the facial nerve was to open the mastoid, to which she and her family were all greatly opposed. It then occurred to me that possibly I might get rid of the dead bone by using some digestive agent. I communicated with Fairchild Bros. & Foster of New York, with the view of using their pepsin. They called my attention to Enzymol, as a preparation of the digestive ferment especially designed for such uses—as a solvent of pus, morbid tissue, necrosed bone, etc. This was used persistently for several weeks at the office and by the patient, with the result that improvement began very speedily and continued until all the carious tissue was apparently destroyed and the spot healed. As the recovered spot healed, the paralysis of the face improved, and she is not troubled on that account or from vertigo at present.

Dr. Bellows: There is not much further to add upon this subject. It would be very interesting, in the case Dr. Shepherd spoke of, to ascertain whether the carious disease was due to a local cause or whether it originated in the middle ear, extending through the mastoid.

The case of Dr. Schenck is one he may well be proud of. The action of those agents, which is a recent use of them, is, by his case, exemplified most happily. There has appeared since my paper was written, a report of a series of cases of caries and necrosis, treated by a Norwegian physician, Dr. Ole B. Bull, with a 4 per cent. solution of hydrochloric acid, which, so far as I know, is the most recent mode of treating such affections. The results which he obtains are very encouraging, but his report refers almost wholly to caries of the tympanic cavity, or the extreme inner end of the canal. He had, I think, only four cases, out of a long series, which concerned the external canal. In the tympanic cavity he succeeded best, but he ends his summary by a statement that in caries of the external canal, the use of hydrochloric acid is not to be recommended. So far as I know, then, the treatment of carious spots in the meatus, which I have advocated, that is, the curette, when admissable, the hydrogen dioxide and the homœopathic *Silica* internally, still remains the best.

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NASAL FIBROMA—A CASE—OPERATION AND AUTOPSY.

By Thos. M. Stewart, M.D.,
Cincinnati, Ohio.

HOWEVER interesting it might be to preface the report of this case with a review of the latest facts regarding fibroma as it occurs in the nose or naso-pharynx, that phase of the subject must be passed over for the present. At a future time I shall hope to take up the subject when I can command more leisure than has been possible since the case first presented itself to my notice. I have much of the literature of the subject, but it would not profit this assembly, nor would it coincide with my desire to present a hurried review of so important a subject.

Therefore I shall cling closely to my subject and simply render a report of the case.

Case.—The patient was a little colored girl aged eleven, badly nourished and living amidst unhealthful surroundings and in an unsanitary manner.

She was first seen by me on October 11, 1898, among the patients at the regular Saturday eye clinic in Pulte Medical College. She had attended the clinic some little time before, but had not been referred to me for class instruction until on October 11.

History.—Five months previously the left eye was first noticed to be protruding from its socket. No medical attention was given the child until after the condition had lasted three months. There had been no pain at any time. Post nasal hæmorrhages had also been noticed at about the time the exophthalmos was first noted.

Nasal respiration was good before the eye protruded, but it was less free, progressively, after the protrusion of the eye. The patient was one of four children (all girls), one sister died in infancy. The mother is a large woman and has had considerable trouble with frequent enlargement of the cervical lymphatic glands. Father is a large, strong man, and his personal history was good. There had been frequent hæmorrhages from the nose, which *Phosphorus* and *Geranium,* prescribed by the clinical assistants, controlled nicely each time.

Examination.—Left eye protruded straight forward; restricted excursions in all directions; no abnormal external appearance of eye; fundus examination showed a white nerve, small arteries and large, tortuous veins.

The left orbit felt free to the finger except at the inner side, where a hard protuberance was detected; the protuberance extended back as

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far as finger could reach. Needle passed into it, excluding a bony growth.

The left nostril was then examined, and a large, hard, smooth, pinkish growth was found filling that nostril from front to back, pushing the septum into and occluding the right nostril.

The growth bled easily; cocaine had no reducing effect upon it; no attachments to septum were found. Pieces of growth removed for microscopic examination. The post nasal space was free—the nasal growth could be felt in the nasal passage; none of it could be detected in the post nasal space—either before or after the autopsy.

The specimens were examined by Dr. L. D. Meader and pronounced fibro-myxoma. Specimens from the deeper parts showed more of the fibrous tissue, hence the diagnosis as fibroma of the nasal cavities.

Operation.—The parents reluctantly consented to an operation only after seeing the horrible frog face develop. No hope was held out to them. On December 15, 1898, the patient was brought to the operating table in the Ohio Hospital for Women and Children—having been in the Hospital some twenty-four hours previously.

The left nasal cavity was opened by the Bruns operation, the tumor was removed by the wire ecraseur. Hæmorrhage was controlled very largely by the actual cautery. As the operation was about completed, the patient gasped and never returned to consciousness, though strychnine hypodermically, artificial respiration, sphincter dilatation and the electric current were tried in vain.

Nothing was to be done but to inform the parents who were waiting in an adjoining room. They were anxious to know the full extent of the trouble, and a post mortem was held.

In addition to the mass completely filling the left nasal cavity, pushing the septum into and occluding the right nostril, and pushing the nasal bones out, thus giving the frog face appearance, we found the cribriform plate of the ethmoid raised up and as thin as tissue paper, so that a portion of the growth one-half inch in diameter projected, in a rounded mass into the cranial cavity, not as yet having caused any cerebral inflammation. The orbit was also filled by a pushing out of the os planum of the ethmoid.

DISCUSSION.

Dr. A. W. Palmer: The author is to be thanked for the report of such an interesting clinical case.

I wish to compliment him upon his independence for reporting a case which does not at all appear to be a brilliant success. All cases are not successful. And we frequently learn as much from similar cases as from very successful ones.

This is the more instructive because of late fibroma of such magnitude are becoming more rare in this vicinity of the body—for the reason, that as rhinology and laryngology advances they are recognized earlier, when small and amenable to intra-nasal surgery.

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Dr. Stewart's Case of Nasal Fibroma.

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As I agree with the author's opinion that if we should enter into a discussion on fibroma in this body, it should be very thorough—such would be lengthy and it does not seem a fit time now; therefore will call attention to but two points.

The operation—Brun's—spoken of is the laying to one side, of the whole external nose. The incision in the soft tissues is commenced below the ala in one side and carried horizontally across under the nose, carry down to bone, but with care that the mucous membrane of the gingivo-labial fold be not cut through. Make a second incision across the narrowest portion of the nasal bridge, just above the canthus. Then connect the corresponding ends of the above incisions by a third one, parallel to but a little beyond the nasal furrow.

Now with a small saw commence at the outer lower corner of the anterior nasal opening in the skull, beneath the commencement of the first incision in soft parts—saw downward about ¼ in., then horizontally to about a ¼ in. beyond the lateral margin of the bony opening, saw upward parallel to such margin to a point just above the canthus, then make a horizontal cut to the opposite side through the upper portion of the nasal process of superior maxillary and nasal bones.

Finally incise the septum narium and the whole external nasal organ can be laid over onto the cheek.

In this manner a strip of bone ¼ to ⅜ in. wide can be cut away from the border of the anterior nasal opening in the skull, thereby giving a very large opening through which to operate in the nasal cavities. No large blood-vessels are encountered.

A circumstance that I have noticed of late which has interested me, is, that although fibromata are tumors of approaching adolescence, still in the literature of the past two years, there have been four or five times as many cases reported occurring in individuals over 45 years of age as below 30 years.

Believing that these tumors will frequently spontaneously disappear at about 25 or 30 years of age by retrogressive tissue metamorphosis, a "let alone" treatment is often advised.

Now on account of these tumors being so frequently found in older persons I think it behooves us to be more careful in such prognosis and keep strict supervision of such cases.

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INTERNAL REMEDIES IN EYE AFFECTIONS.

By Wm. A. Phillips, M.D.,
Cleveland, O.

I WISH to say, preliminary to the reading of the paper, that I have said nothing at all in regard to the subject of bacteriology as having relation to the use of internal remedies, as the status of the subject is indeterminate. The systematic proving of medicine, and keen clinical observations are the two grand steps that indicate the direction in which we must conduct our researches to sustain the claims of our law of cure.

The possibilities arising out of these two steps and the interminable amount of careful investigation demanded in order to develop all the virtues of medicines are features which are more and more fully appreciated as clinical work is multiplied. The field of minute anatomy, of physiology, of pathology, and of the peculiarities of diseases, is gradually broadening and this means to the specialist as well as to the general physician an ever widening circle of study. We know that no two cases can be absolutely alike—they may be near enough alike so that the same remedy will commonly cure: but for all this we know that each case has certain peculiar symptoms and hence each individual case is a problem in and of itself and should consistently be solved separately. If time, sharp discrimination, the best diagnostic appliances, and profound culture for the work, could always be brought to bear, it is no doubt true that we could more nearly approach the aim in view. It is fair to assert that it is the failure in one or more of these particulars that all possible cures are not made, rather than because our law is not strictly applicable in the whole realm beyond the purely physiological. We cannot keep it too well in mind that there is no such a thing as a specific, in the sense that any one medicine will cure any one disease in all people who may be attacked. A medicine is specific in so far as it cures in any given case. Naming a disease and naming a medicine, that has been known or thought to cure, are but a small part of really scientific treatment. But it is so much easier to do this, and to exhibit medicines in doses to produce physiological effects and thus give the greater appearance of doing something tangible, that many physicians have failed to devote the time and study necessary to make

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a discriminating prescription. We must ever bear in mind, that both objective and subjective symptoms are *quantities,* so to speak, whose absolute and relative value we can never put down as constant. There are astonishing modifications of symptoms strictly within physiological limits that give no particular trouble, while there are exceedingly minute changes in the pathological field which often give no end of trouble; thus showing that the relation existing between physiological and pathological disturbances cannot always be exactly determined. We have a live machine to deal with whose horse power cannot be accurately put in figures—a machine in which the significance of the symptoms depends primarily upon two things: 1. The physical condition of the visual apparatus; and 2. The power and constancy of the nerve supply. It is here that we as oculists see somewhat clearly defined our therapeutic limitations. If there is, in any given case, a malformation of the eyeball disturbing normal refraction, there is at once a foundation for the development of symptoms, which from the nature of the case, cannot be cured by internal remedies, however perfect the correspondence between the "totality of the symptoms" and the pathogenesis of any drug. Palliation, if even that can be obtained, will mark here the limit of therapeutic measures. In those instances, however, in which well defined diseases have been developed in consequence of the strain resulting from imperfect refraction, and in which the error has been corrected, there will be found a more distinct sphere for the exhibition of internal medicines, on account of the fact that the physical cause of the disease is practically removed. We thus have thereafter symptomatology and pathology to deal with and not at the same time the direct influence of malformation. But in addition to any inflammatory diseases that may occur from the above cause (error of refraction), there sometimes develop a series of cases immediately resulting from an inadequate power and constancy of the nerve supply. This like the malformation may be congenital, or acquired because of the long continued depressing effect of the muscular strain. Here is a field for sharp discrimination in selecting the right prescription, for we must know first, whether there is perfect optical correction; second, whether the symptoms are directly acquired through in-coördination; and third, whether they are due to reflexes from other parts of the body. These points being settled it may be found that nothing more than a purely physiological disturbance, so far as we can determine, remains as a target for our prescription. It is clear, that the symptoms arising from imperfect refraction do not offer the same opportunity for

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the genius of the materia medicist as do those symptoms arising idiopathically and which are uninfluenced by physical causes. Here is a cardinal point for the general practitioner that he may know why it is that oculists have to resort so frequently to lenses, ocular gymnastics, and to the scissors to the harmless exclusion of "attenuations" in the immense majority of optical and muscular defects. The reason why oculists have been taken so much to task for not giving something more specific in the use of medicines, is because physicians have not, and do not, understand the real character of this large class of cases. But our therapeutic limitations do not cease here, and that is due principally to the peculiarities of the anatomical structure of certain parts of the eye. The optic nerve, for instance: almost before we have an opportunity to make a diagnosis grave pathological changes occur there in cell infiltration of the interstitial connective tissue and before its influence upon the delicate nerve fibres can be arrested the initial steps of atrophy have placed the case beyond certain restoration. Our clinical experience as a school has not enabled us to treat these cases successfully: and as for the old school a high authority says: "diaphoresis or mercury and iodide of potassium may be tried." Furthermore, it is not at all probable that provings can ever be conducted in such manner that they will materially help us in inflammation of the optic nerve. Only a long continued, painstaking course of discriminating clinical observation can aid us in this line. The same may be said of the choroid: the same of the structures implicated in glaucoma; the same in affections of the lachrymal apparatus; the same in regard to trachoma and other diseases of the lids. On the other hand, most satisfactory results are obtained by the use of internal remedies in inflammation of the retina, the iris, and the cornea notwithstanding in the latter two certain local measures are at the same time demanded. These specifications might be carried out to considerable length, but the above is enough to indicate in a general way what I wish to urge. In view of the fact, now, that the progress of medicine has not reached that state of perfection where we can indicate to others, or to ourselves even, definitely what is to be administered in all known conditions, the leading question for us as a society is: What is to be done to forward our specialty? Before we can designate anything more definite than what we already have to rely upon respecting the range of our law of cure, we must be

I. Strictly Systematic.—This clearly relates to (a) An accurate record of the symptoms of each case from first to last. (b) The instruments used as an aid in making the diagnosis. (c) What medi-

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cines were given and the attenuation. (d) What palliative measures, if any, were employed.

II.—We must discriminate sharply between purely functional symptoms and those of pathological import.

Under this head it must be conceded that we labor under a cloud of uncertainties.

Not until the study of pathology reveals to the physician the true and full significance of all functional disturbances in the real bearing they have upon each case; not until we can know the full significance of every symptom that points to the destruction of function or of tissue; not until we know more of the true character of all the diseases attacking the eye directly or indirectly; and not until we have the most perfect provings possible of the medicines used; not until all this illumines the realm of practical medicine can we expect to attain to that degree of success in all diseases which we now enjoy in the treatment of a few. For, as already intimated, it is directly along this line of distinction between symptoms that have pathological import and those having only a purely functional character that we arrive at a diversity of opinion concerning diagnosis and treatment. One physician attaches an importance to a single symptom or to a group, which another physician may regard as incidental and of comparatively little value. Not until well informed physicians can consistently and uniformly arrive at the same conclusion in diagnosis and treatment of any given number of cases, will we be able to rejoice in the happy thought that ophthalmology is an exact science.

DISCUSSION.

Dr. Moffat: We must never forget that we are homœopaths and have a debt to pay in the advancement of homœopathy; we have an advantage over some physicians in that we can fairly see the pathological condition underlying some of the subjective symptoms—it is our duty to incorporate this into the materia medica by annotated verifications. I take issue with Dr. Phillips if he says our remedies cannot help incipient atrophy of the optic nerve; *Nux., Strychnia phos., and Zinc phos.* have done good service here.

As to his point of defending ourselves against the general practitioner for not prescribing more, I reply that we are *removing the cause*—in obedience to Hahnemann; when that does not suffice to cure the symptoms we prescribe the indicated remedy.

Dr. Boynton: I am reminded of two cases causing me a great deal of anxiety, which went from good vision to blindness, notwithstanding my careful selection of the single remedy, given in attenuated form and according to the law of similars. The first case was a man who ac-

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quired syphilis, of which I was not aware at the time of treatment. He was sent to me by his physician for an examination to explain if possible the cause of his recently impaired vision in one eye. I found nothing. No ophthalmoscopic changes were observed at the time of examination, but he had quite a high degree of hypermetropia with astigmatism. In attempting to correct that I found he had amblyopia. Either the changes were so slight or my powers of observation were so limited, that I found no abnormal condition in the left fundus. Four days later that man came in with pus in the anterior chamber. Then the ophthalmoscope revealed some trouble in the vitreous humor and some choking in the disc. Of course I was alarmed and put him to bed. I saw that eye become totally blind, the second one become involved in a similar manner, and the patient so blind he could barely distinguish light from darkness. Meanwhile, the nurse had informed me of mucous patches in the mouth and in the pharyngeal space which explained the cause of his disorder. I had been religiously giving *Hepar sulph., Gelsemium, Bromium* and similar remedies. But now we put him upon the orthodox single remedy according to Dr. Moffat's definition—2 grammes of the unguentum hydrargyri rubbed into the skin daily, morning and evening. I had the satisfaction of seeing that eye clear up and the patient recover perfect vision, notwithstanding dense opacities in the vitreous humor. I do not think I am any the less of a homœopath for this selection of the single remedy.

The other case is one of sympathetic ophthalmia, where the right eye was injured by the bursting of a lamp from having a stone thrown into it, involving the sclerotic and half the cornea. The wound had healed and I thought I would save the case just a few days for the students who were about having their annual alumni day reunion. I saved him just a few days too long; the fatal period passed; and I think it was four weeks to a day when he developed sympathetic ophthalmia of the other eye. I had never seen a sympathetic ophthalmia with total destruction of one eye from injury in the ciliary region arrested by enucleation, but this eye was removed. Notwithstanding, it went on. There were no external evidences at first. He claimed he had got some sand in the second eye. I had him report every two or three days, but here was the only case of neuritis of this peculiar character that I have ever seen. He went on with a choked disc and neuritis until vision was reduced to mere perception of light. Should I give *Gelsemium?* I did, and I gave *Bryonia* and all the remedies that presided over that class of tissues, until in despair, I gave him the unguentum religiously rubbed into his lymphatic spaces and saw him get perfectly well. And there is a case of sympathetic ophthalmia cured by the inunction of the hydrargyrum. Did it not kill the same thing that caused the inflammation?

Dr. Phillips: The only remark I wish to make in closing, is in regard to the unfortunate circumstance that some of these cases are apparently cured by the use of crude drugs; whereas, according to homœopathy, they ought to be cured by attenuations. The point is,

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whether bacteriology comes in as a matter of any importance. It is a question whether there is septic material communicated, or whether it is purely a nerve influence that produces the disease. If it is purely nerve influence, then our attenuated remedies should cure; if germs have anything to do with it, then it is possible that we will have to use the remedies locally or in massive doses. They must get to the point where the bacteria are in order promptly to destroy them, instead of waiting for them to starve to death.

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SOME OBSERVATOINS CONCERNING THE SURGICAL TREATMENT OF NASO-PHARYNGEAL ADENOID GROWTHS.

By Thomas L. Shearer, M.B., C.M. (Edin.)
Baltimore, M.D.

ACCORDING to tradition, there once was a lad—one of those half idiotic specimens without which no Scotch village is supposed to be complete—who was found sitting by the road side, engaged in cutting away with a pair of scissors, all of the hair about his forehead. On being asked what he was doing, he quietly replied, "Oh, just making all face that will be face." Now as the tendency of modern naso-pharyngeal surgery seems to be of the same order, viz: to make that space as large as possible, it is opportune that we consider briefly some of the points in connection with the subject; for, in Maryland, adenoid operations are as common and as popular with the medical profession as 'coon and 'possum hunts are with the descendants of Ham in Virginia. Young and old—experienced and inexperienced—all are at it and victims are plentiful. Such being the case, one of two things must follow; either the necessity for such widespread surgery exists or some unjustifiable operating is going on. Undoubtedly adenoid hypertrophy is a very common condition in childhood and one that calls for thorough, careful handling. As this paper deals only with the surgical part of it, no reference can be made to that most important factor—the medical or constitutional treatment.

In order to be systematic, let us consider,

I. Diagnosis.

In very pronounced cases there can be no difficulty in recognizing the presence of adenoids, as the well-known symptoms—which are now almost classical—are very clearly marked. The peculiar facial appearance: the broad and flattened nasal bridge, the anæmic and ill-nourished condition, the drooping upper eyelids, the mouth partly open with mouth breathing, the evident difficulty in hearing, the half stupid and inquiring expression—all make up an extraordinary picture, one not easily forgotten or overlooked. When to these symptoms are added the absence of deviated septum or marked turbinate hypertrophy, the

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history of repeated attacks of bronchitis, persistent nasal discharges, ear-ache, restless nights with snoring or snuffling respiration; occasionally night terrors, with sensations of suffocation the result of deficient air supply, we have further confirmation. In many instances the patient's voice undergoes a curious change in resonance as the sound waves impinging upon the post-nasal growths are thrown back and produce a deadened quality, which varies according to the size of the space and the degree of the hypertrophy. In saying "3, 2, 1." the one becomes "wudt" in severe cases and all shades of modified tone may be encountered between the normal and the extremely dead quality; "m" is pronounced "eb" and "n" as "ed." Owing to interference with the proper cerebral circulation, children with adenoids are often inclined to be slow at their studies and have not power of mental concentration—a condition to which Guye has applied the term "aprosexia." In a case in which doubt exists concerning the presence of adenoids a good plan recommended by Dr. Eugene S. Younge* is "to wrap a fold or two of handkerchief around the proximal phalanx of the forefinger of the right hand, care being taken that the folds are not voluminous enough to prevent the finger being inserted in its whole length. Then, standing on the right hand of the patient (who is seated), with the *left* hand resting lightly upon his head, so as to grasp it firmly if necessary, the surgeon passes his finger rapidly backward, palm upward, not to the uvula, as is frequently done, but behind the right posterior pillar of the fauces; the finger, on being rotated upward will then slip behind the velum. The surgeon should now feel for the septum, and pass the finger upward until the growths are impigned upon, when the sensation will be akin to that of varicocele and on withdrawing the finger, the presence of blood will confirm the diagnosis."

When one has made many examinations the peculiar sensation imparted to the finger when touching the Eustachian tubes, is easily distinguished from the soft adenoids which yield so readily to pressure. If the digital examination is inconvenient, any of the post-nasal forceps may be introduced to obtain a sample; or, a Munger curette can be used as a sound, for if growths are present, it sinks into them and resistance is felt when one attempts to push it downward; if no increase of tissue has taken place, it slips easily over the smooth pharyngeal surface.

II. Anæsthesia.

Whenever possible, I think that surgical measures for the relief of

* Medical Brief, April, 1899.

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adenoid hypertrophy of lesser degrees should be carried out without an anæsthetic. That the growths should be removed, in a number of sittings, in one's office. When, however, we find that the amount of the tissue is very large and that too many sittings would be necessary for its removal; when the patient is being greatly upset by nervous shock; when the subject is an unruly child, whose entire time is occupied in keeping the teeth firmly in apposition, in planting his feet in your epigastric region and in entertaining the waiting room with heart rending screams; when the patient will not consent to office treatment, and lastly when, after such treatment, the tissue persists in causing returning symptoms, the subject should be anæsthetized and the post-nasal space properly cleared. In England, nitrous oxide gas is employed for the lighter cases. Until recently chloroform, which is considered *the* anæsthetic for children, has been largely used both in Europe and in America for these as well as for tonsillar operations. Dr. Hinkle,* however, has collected the records of 18 deaths following the administration of chloroform for the removal of naso-pharyngeal adenoids, hypertrophied tonsils or both. In 4 of these cases, death occurred before the operation was begun; in 3, from a few moments to an hour after the operation was completed. In 1897, during a discussion of this subject in the British Laryngological Association, both Wyatt Wingrave and Dundas Grant referred to the high mortality under the use of chloroform in such surgical cases and strongly advocated the employment of some other anæsthetic. In Vienna, Paltauf, Kolisko and others have made a number of observations which may assist us in understanding the extraordinary mortality under chloroform in this operation. They found, post mortem, in a number of cases of sudden death from slight causes that there was present hypertrophy of the lymphoid tissue throughout the body, including the tonsils, the lymphoid structures at the base of the tongue and the naso-pharyngeal adenoids. The thymus gland was persistent and often very large, and the intestinal follicles were markedly hypertrophied. In addition there were frequently present a dilated heart, not dependent on valvular lesions and at times a narrowing of the aorta with small size of the peripheral vessels. This condition which has been called the habitus lymphaticus, was found among others in a number of cases of death during chloroform administration. *Persons so constituted seem to have little power of resistance to comparatively light shocks.*

* N.Y. Medical Journal, Oct. 1899.

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Brickner,* commenting upon Kolisko's report of habitus lymphaticus, says: "It would seem, therefore, that in anæsthetizing patients of the lymphatic temperament, or in whom lymphatic enlargement or adenoid vegetations exist, chloroform should be rigidly excluded." Statistics as well as pathological studies certainly appear to confirm this view and we are forced to the conclusion that the administration of chloroform in the removal of hypertrophied pharyngeal and faucial tissue is attended by grave risk. This view so impressed itself upon me that, for some time past I have employed ether for all adenoid operations where a general anæsthetic was necessary. The objections to ether are that, in operations about the face, the patient comes from under its influence very quickly and as the cone is frequently removed while operative steps are being carried out, surgeons are annoyed by occasional delays in completing their work. To avoid this, take plenty of time and proceed only when the patient is properly anæsthetized; not when barely under its influence and when the nerve centres, in consequence, are extremely sensitive to shock. Ether, when inhaled, is accused, in some instances, of causing profuse secretion of bronchial mucus and thus increasing the difficulty of respiration during the use of the anæsthetic. To overcome this complication never give ether to a child when it is suffering from a marked case of bronchitis; treat the latter medicinally and when bronchial symptoms have subsided, any secretion occasioned by ether is not apt to interfere seriously with its use. Ether sometimes produces retching or vomiting. To guard against any accident during this period, do not allow the patient to partake of any food or drink within six hours of the time set for operation. Chloroform is a cardiac depressant and renders any possible chance of nerve shock much more apt to be fatal. Ether is a stimulant and rather combats the effect of surgical shock. But to still further assist our patient, it is a good plan to administer hyperdermically $^1/_{50}$ grain of strychnia sulphate, ten minutes before beginning the anæsthetic; to give the ether only when the patient is in bed—not on the operating table—and where no evidences of any surgical preparations can be seen or heard. These measures go far towards producing that mental quietude so useful in those about to undergo any surgical operation. When, therefore, neither the bromide of ethyl or nitrous oxide are employed, ether should be given the preference; *upon no account should the use of chloroform be considered for one moment in any*

* Op. cit.

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of these cases, as there is a growing feeling among medical men that it is the most treacherous of all anæsthetics.

III. Position of the Patient.

Every operator naturally adopts that position for his patient which experience and convenience have apparently shown him to be the best. In my own sanitarium, the patient when thoroughly anæsthetized, is placed flat upon the back on the operating table, the head and part of the shoulders are allowed to hang well over the edge of the table, but the occipital portion of the head rests upon the knee of the anæsthetist. The gag is now introduced and the operation is begun, stopping only when more ether is necessary or when the blood is mopped from the pharynx. This posture of the patient permits a flood of light from the sky-light to fall into the oral cavity and enables the operator to watch carefully the soft parts about the uvula in order that they may be free from any injury. It also permits the blood to flow easily from the nostrils and thus diminishes the amount of blood and mucus that one usually encounters in the oro-pharynx. In addition to these advantages, the anæsthetist is in such a position that he is also able to render great assistance during the operation, by keeping the anterior nares clear of blood, by occasionally mopping the pharynx with a piece of gauze grasped by forceps and by altering the angle of the head when requested to do so by the surgeon. The nurse attends to the instruments and particularly sees that a number of gauze sponges are always ready for instant use, in the event of sudden profuse hæmorrhage taking place. A good assistant and anæsthetist is worth his weight in gold and can be a source of great comfort to the operator, while an incompetent one is capable of rendering one's life a burden. When the patient is a female, it is best to encase the hair in an oil silk or thin rubber cap and thus keep any blood from trickling on to the scalp and becoming matted with the hair. After the operation the head and shoulders are allowed to rest on the table, the gag removed and the face well cleansed. In the position just described, it is rarely necessary to turn any one upon the side to permit the discharge of blood or mucus, excepting, of course, occasions when vomiting is taking place. Some surgeons advocate the Trendelenburg posture for these operations, but personally, I have not been inclined to try it as one would naturally expect a greater degree of local blood pressure as a result of the excessive body elevation and proportionately greater tendency to hæmorrhage.

We come now to,

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IV. The Operation for Adenoids.

(a) Office operation without an anæsthetic.

If the child is under five years of age and the growths only moderate in amount, they may be removed by using the finger to clear out the space; if five years or older the hypertrophy is very pronounced, one may employ the Lowenberg or Schultz forceps to sieze the tissue. Many operators apply a solution of cocaine to the naso-pharynx before the introduction of the forceps—a preliminary step that seems both useless and absurd, when we consider that it is not the mere presence of the instrument in the space that hurts the patient, but the sensation as if "the inside of the head were being torn out," when part of the tonsil is grasped and bitten off. Cocaine cannot possibly reach this portion of it and consequently does not actually prevent the much-to-be-dreaded feeling. The use of the powerful curette, without an anæsthetic, when the operator must necessarily work very rapidly, when the little patient submits to the most severe pain merely because he is overcome by superior force, is a disgustingly brutal performance and from a scientific standpoint reprehensible. It is like a blindfolded man who is armed with a sabre and turned loose in a small room, full of people, to cut and slash at random.

(b) Operating under General Anæsthesia.

There can be no doubt that, after all, the most satisfactory and only thorough way to remove adenoids is when the patient is under general anæsthesia; when one can quietly make a complete digital examination and then introduce the instruments, guided by the left forefinger, which also prevents any tendency towards denuding or stripping the bone of its mucous membrane, or injuring neighboring parts. As indicative of the necessity for this precaution, I examined recently a young lady, whose adenoids had been removed by a leading laryngologist of Baltimore. The posterior border of the nasal septum had at least four deep scars—the result of vicious bites from post-nasal forceps—something that should not happen when the instrument is controlled by the forefinger. With the patient's head well over the table, the posterior border of the septum nasi lies in an oblique direction, the *sphenoid end* pointing towards the *floor of the room.*

It is absolutely necessary that we bear this in mind and keep the forceps blades approximately parallel to the posterior pharyngeal wall. If we should happen to grasp the edge of the septum, there is a peculiar sensation imparted to our hand; there is a feeling of something

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firmer in consistence than adenoid tissue and which does not seem to yield in the least to moderate tension. If such be the case, let go at once as most surely we have bitten the sphenoid end of the septum. Operating with the curette, when the patient is in this position, requires that the assistant elevate the head for a few moments until it lies in the same plane as the body; this change enables us to have a more intelligent and clear use of the instrument. The Eustachian orifices are also sometimes injured but usually escape because they are rather slippery and are placed in their peculiar lateral position—no thanks to the efforts of the operator. It is well to introduce instruments as seldom as possible as the degree of shock will naturally be in proportion to the number of such assaults upon the region.

The digital exploration is of the greatest importance, as upon the character of the tissue, and the space in which we have to work will depend the choice of instruments. Only during the present year Newcomb,* of New York and Dundas Grant, of London, have related cases in which an exaggerated prominence of the anterior arch of the cervical vertebræ has so altered the conformation of the post-nasal space that only a special variety of forceps (Quinlan's) and Golding-bird's curette could be used. In the regular adenoid work it is convenient to begin with a large pair of forceps, then to follow with small forceps, then the curette next to clear away fragments with forceps again and lastly to remove shreds with the index finger. The early morning hour is an excellent time for these operations and whenever it can be managed they should be performed in a sanitarium or hospital—as private houses are apt to be greatly upset by the preparations which are necessary to render the home operating quarters as aseptic as possible. It has been my rule to have assistants, nurses and operating room as thoroughly surgically clean as if for an abdominal section—for the removal of adenoids is entitled to just as much care as any other more serious surgical cases. After the operation the patient is placed in bed for twenty-four hours, kept on milk diet and the naso-pharynx sprayed twice daily with any of the ordinary antiseptic solutions, such as Dobell's or Seiler's. In some instances, children do not make use of their newly acquired power of nasal respiration but continue to breathe through the mouth until broken of the habit by the constant watchfulness of their parents.

In conclusion, let us consider the question,

*N. Y. Academy of Medicine—Section of Laryngol., December, 1898.

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V. When is the Operation for Adenoids Indicated? .. ..

There are many cases of moderate hypertrophy in which hygiene, diet and the persistent use of suitable internal remedies, such as *Calcarea iod, Calcarea phos,* and *Baryta iodatum* are all that is necessary to bring about a normal condition of the naso-pharynx, but when they do not respond to these measures and present the following symptoms, surgical interference is justifiable:

(*a*) When there are repeated attacks of earache, suppurating ears or merely deafness—the result of adenoids.

(*b*) When the child is inclined to aprosexia, provided the physical signs of growths are well marked.

(*c*) When there is mouth breathing of a pronounced type.

(*d*) When constantly recurring attacks of bronchitis, laryngitis and nasal discharges are kept up by the growths.

(*e*) When nocturnal eneuresis of a severe type, is associated with adenoid hypertrophy. Operation may or may not relieve the annoying symptom.

(*f*) When the child suffers from suffocative seizures during sleep —the result of deficient air supply—oxygen hunger.

(*g*) When the voice is very much deadened in resonance.

(*h*) All cases presenting a family history of tuberculosis and in whose childhood days, above all other children, the great necessity for a normal breathing apparatus is most essential.

(*i*) When batting of the eyelids, constant sniffling and twitching of the facial muscles is indicative of reflex irritation; which may develop into a true choreic condition.

These are some of the most important indications for operation, and while I am a staunch advocate of prompt surgical interference *in many* of these cases, *in all* of them I recognize the great and absolute necessity for careful constitutional treatment.

DISCUSSION.

Dr. J. B. Garrison: Dr. Shearer, in his able production, has left but little that I am able to criticise, his ideas and methods being so nearly in line with my own; I cannot award him too much praise for his labor in presenting this subject in such a clear and comprehensive manner, making it, indeed, a classic.

I believe that in the majority of cases, it is best to make a digital examination in order to accurately determine the location and character

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of the growths to be removed, a proceeding which can, by practice, be done quickly and at the same time satisfactorily almost before the child has an idea that anything is being done. I have never found it necessary to protect the finger at all, but I may sometime wish I had.

I think that the cases that are best operated in the office making more than one sitting of it, are rare and I should not advise it. I believe that it is better for both the surgeon and the patient, as a rule, that a general anæsthetic be given; and I fully agree with the author that a hospital offers the best facilities for good work. Personally I have never seen any unfortunate results from the administration of chloroform, but in view of the deaths that have occurred, we should, if we use it all, be careful to assure ourselves that those upon whom it is to be used are not of the hypertrophic disposition spoken of in the paper.

The use of ether takes a little more time, but that is a factor that does not count when the safety of life is at stake.

The author truly says that the position of the patient during operation which is best, is the one with which the surgeon is most familiar. My habit is to place the patient on the right side and a sand-bag of two feet long by four or five inches in diameter placed along the back will greatly help to retain the position, permitting the nurse to devote her attention to other things.

In this position it seems very easy for me to introduce my left index-finger back of the palate and to introduce the forceps and grasp the growths, while the blood flows readily out of the mouth.

The early morning, while the patient is quiet, is by all odds the best time to operate upon the little ones.

Dr. Hooker: This is a most admirable paper we have just listened to from Dr. Shearer. His experience and his methods are almost identical with mine. It is a number of years since I have operated in such cases under chloroform. When I give a general anæsthetic it is invariably ether. My method differs from his in only one particular, and in just one way from Dr. Garrison's also. It seems to me that we get the best position—at least for me—in putting the patient on the left side, with the head just over the edge of the table; and then the assistant can give the anæsthetic and hold the head in such a position that the blood will drain out of the nose and out of the mouth. That is the only way that I differ from Dr. Shearer at all in regard to the operation. In all his other conclusions I am with him heartily. It is rare, I think, that we find, in so few words, so much said as we have heard in this paper.

Dr. Rice: I was extremely interested in Dr. Shearer's paper. It covers the ground completely and brings to the front the different points upon which there is difference of opinion, thus giving us the opportunity for a discussion which I am sure will aid us in our future work.

Regarding the use of an anæsthetic, my experience has been similar to that of Drs. Shearer and Hooker. I did use chloroform at one time, but, seeing the articles mentioned by Dr. Shearer, gave up this anæsthetic and performed all my operations with the aid of ether.

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I have had some experience with the different instruments in use for this operation and at one time used forceps, but after a time was compelled to give them up almost altogether in favor of curettes. It seems to me that by using different forms of curettes of different sizes of fenestræ, that the naso-pharnyx can be cleared out safely and quickly —much more safely and quickly than by the use of the forceps.

This instrument is not a safe instrument in the hands of all operators. Dr. Shearer has spoken of a case where injury occurred and I have recently seen a case where an Eustachian orifice was nearly destroyed, cicatricial contraction following as a result of the careless use of the forceps.

In position of patient I agree with Dr. Hooker; it seems to me that with the patient on the side, with the head hanging over the edge of the table, held by an assistant who also supports the mouth gag, the position is almost perfect for both the operator and the patient. The blood and discharges drain away rapidly from the nose and the mouth, and one soon becomes able to work surely and expeditiously on the faucial as well as the Luschka's tonsil.

Dr. Haywood: One or two points I would like to refer to not spoken of,—that is, the holding out of the soft palate. I usually introduce a catheter to which I have attached a small piece of bandage, one-half inch wide by a foot long, pass that through the nose and out through the mouth, and in that way tie forward the soft palate. I believe in this there is no danger at all of touching the uvula or the soft palate. I never use anything except the Gottstein curette and never have any bad effects. For my first operation I used forceps and did have a little trouble with the ears; but with the Gottstein curette and going in afterwards with my finger nail I find that is all that is necessary.

Dr. T. M. Strong: I used chloroform exclusively in these operations for a long time, until I had a patient in whom the breathing and pulse stopped completely for a few moments only, but it seemed an hour. It was about this time that articles began to appear calling attention to the danger of chloroform in operations for adenoids. That there seemed to be a predisposition in some of these patients to be seriously affected when under this anæsthetic. It was the first time that my attention had been called to the possibility that, contrary to the usual theory, chloroform was not safe for children, suffering in this way, however it might be in other conditions. This had been rather the general working rule with surgeons. Since then I have stopped the primary use of chloroform, although in this instance the fault might have been with the anæsthetiser. I very frequently, however, follow the ether anæsthesia with chloroform, if they are a little restless, as you can work under the chloroform mask, where you cannot under the ether cone.

The instruments mentioned by Dr. Shearer I have found advantageous, and I have used in addition, with youth and adults, the Farlow Guillotine, with which you can remove the pharyngeal tonsil in the

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same way as the faucial. The instrument can be used in the office, or at the home, without an anæsthetic. I do not believe any child should be operated upon with the end of the finger, except as a temporary measure, and no operation at any child age, without an anæsthetic. I should hate to attempt the curette operation, even in an adult, without anæsthesia. With the guillotine, however, as a rule, you can remove the hypertrophied mass very completely with one cut.

Dr. A. W. Palmer: I should like to emphasize the constant use of the finger,—the digital examination of the pharynx. It is a thing that I have found is not used as much as I think it should be. It is a good idea, not only in examining for adenoids, but when you become accustomed to it, the position of the parts and of the septum, can be made out as can also Luschka's tonsil and the prominence of the Eustachian eminence. You can get inferior turbinated hypertrophies, which frequently accompany these cases. With children especially, I think, it is easy, their mouth being rather shallow. You often find quite a little difficulty in getting a postero rhinoscopic view with the mirror, so I depend almost entirely upon digital examination in these cases, finding it saves a great deal of time. After a little practice it is not so disagreeable to them.

Dr. F. Park Lewis: Dr. Shearer seems to have covered the subject entirely, as far as children are concerned; but during the past year, I have been led to adopt the exploratory diagnostic test in those of more mature years than the children in whom we often find adenoid growths. In many of the most intractable forms of chronic middle-ear catarrh I have found obstructions of lymphoid hypertrophies in the vicinity of the mouth of the Eustachian tubes. I have very materially helped cases that have previously resisted all manner of treatment by removing these hypertrophies with the curette, or forceps. It was a new experience to me. I had not until recently learned the necessity of making an examination in this connection. While the fact that there were obstructions at the mouth of the tube of one kind or another had been recognized, it was impossible to see them with the laryngeal mirror. It not infrequently happens that the surface appears to be smooth in the mirror, and that the ocular appearance is not sufficiently characteristic to indicate that there are hypertrophies; but the delicate finger-ends recognize at once that there are hypertrophies at the Eustachian tubes, which can be readily removed by the finger.

Dr. Mueller: This is a most interesting topic. We are all of us, perhaps, taught by our own experiences rather than by anything else. In a series of over 700 adenectomies I have made use of nothing but Gottsteins' curette and I have yet to find any particular difficulty in removing the growth. With regard to the anæsthetic, my preference is chloroform. It is not necessary to induce deep anæsthesia and children seen to rally more rapidly from its effects. I have in three cases, where there was an acute otitis media, operated for adenoids. I first did it in sheer desperation. There were repeated attacks and as I believed the adenoid growth to be the exciting cause I finally operated

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with the immediate result of relieving the ear symptoms. On another occasion I had, what I considered at the time, the misfortune of operating on a little girl aged 8 years, who, on the day following the operation developed a very violent attack of scarlet fever. I consoled myself with the thought, however, that an infection of the curetted surface certainly could not be any worse than an infection of the adenoid mass would have been, and subsequent events proved I was right, for the throat symptoms were very mild, and while the attack of scarlet fever was very severe the child made a good recovery. I am of the opinion that if the naso-pharyngeal region were clear and in a normal condition, the various exanthematous diseases would seldom be followed by the serious disturbances that we so often see.

Dr. Shearer: Last year I attended a fourteen-year-old boy, that presented very marked symptoms of adenoids, the most prominent features being mouth breathing, suffocative attacks at night and slightly altered naso-pharyngeal resonance. He was so nervous that he would not allow me to even properly examine him; objected to any anæsthetic, and finally, after close study of his case, I told his people that he was suffering from hysterical relaxation of the uvula and the neighboring parts of the pharynx, which simulated nasal obstruction. As he became suddenly worse during my absence from the city, another laryngologist was called to see him. He said that the boy had adenoids, etherized him and on operating found his naso-pharynx *perfectly free from any growth*, thus confirming my opinion of hysteria. It is well to look out for such cases.

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THE USE OF HOT AIR IN THE TREATMENT OF MIDDLE EAR DISEASES.

By H. H. Leavitt, M.D.,
Minneapolis, Minn.

I WISH to call attention to a method of treatment which I consider a decided advantage over the ordinary cold air douching of the middle ear. Nearly a year ago it occurred to me that if hot air was a good thing in the treatment of joint affections, rheumatism, and kindred diseases, it would be equally as useful in treating the Eustachian tube and tympanum. Dry heat stimulates the circulation, relieves hyperæmia, and promotes absorption—ends desirable to obtain in all chronic inflammation.

In order to test my theory I had constructed an air chamber of copper about five inches in height, and about the same in diameter. In one side near the bottom a quarter inch pipe is inserted and a similar one near the top. From the roof of this chamber a piece of pipe capped at the lower extremity is suspended for the thermometer. This chamber is enclosed by an outer casing of sheet iron, nickel-plated. By a gas flame underneath, the air in the chamber is heated to two hundred or three hundred degrees F. By means of the Politzer air-bag, or the current from an ordinary air-condenser connected with the lower opening or inlet, the air in the heated chamber is forced through the upper opening or outlet. This is connected by a piece of rubber tubing to the Eustachian catheter. One or two drops of the medicament which it is desired to use are dropped into an opening in the tube near the chamber. The medicine is quickly volatilized and carried with the hot air through the catheter into the Eustachian tube and the middle ear.

The advantages evident by a few months' use of this apparatus are: First, increased comfort to the patient compared with the use of cold air douching. Second, increased efficiency, the hot air relieving congestion and promoting absorption, much more rapidly than the cold air. Third, the superior effect of the medicines, their penetration being much more marked. One drop of medicine in the tube is volatilized so rapidly and so completely that its effect in the ear is almost immediately felt, and endures for a longer time. I think the use of hot air will bring about a

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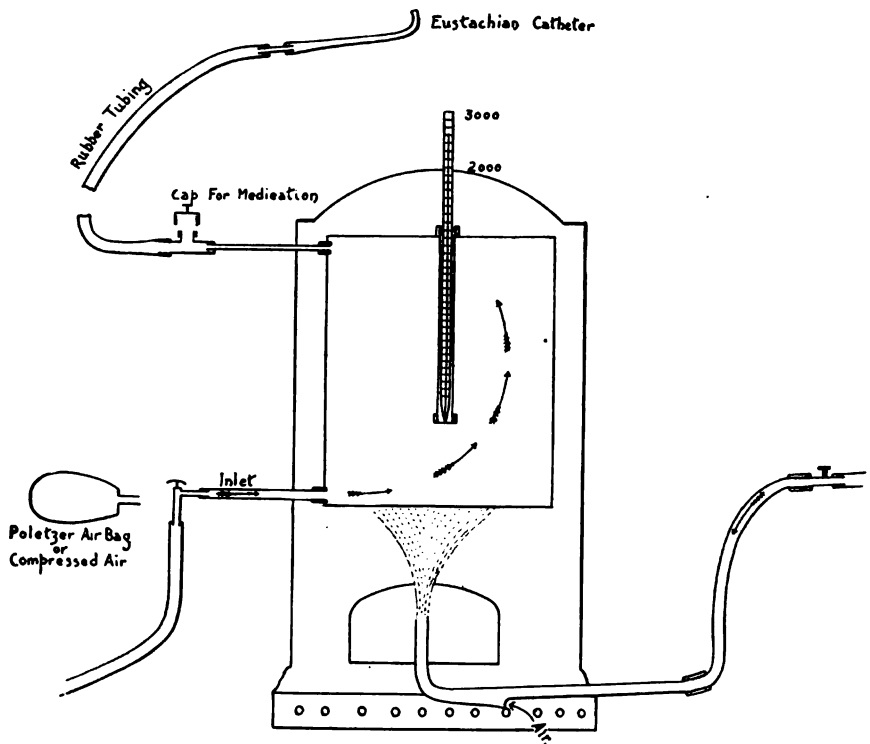

DR. LEAVITT'S APPARATUS FOR TREATING MIDDLE-EAR DISEASES WITH HOT AIR.

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given relief of a pathological condition in less than one-half the time that it takes by the cold air method. The remedies that I have used mostly are menthol in refined oil of pure tar; menthol and camphor in alboline, and iodine in glycerine or ether—the same remedies that I have been accustomed to use in the Dench vaporizer. The cases in which I have used it have all been chronic middle ear catarrh. The apparatus which I have used and the method of using it can be seen here and may be freely discussed.

DISCUSSION.

Dr. Hasbrouck: Dr. Leavitt, in calling our attention at this time to the value of hot air in the treatment of middle ear diseases, has brought up a much neglected subject and one that I believe deserves greater attention than has been given to it of late. It is a means that gives promise of good results if properly applied. There is no question but that hot air is more desirable than cold air as a means of inflating the middle ear, and for a long time heated medication has had many advocates among the best thinking men of the profession in the treatment of diseases of the respiratory tract and, though its use in the treatment of aural diseases is by no means new, I believe it has received but little attention and if Dr. Leavitt, in presenting this subject to us anew, is the means of creating a new activity for its use he deserves our thanks.

While Dr. Leavitt makes no claims for originality in adapting this method of treatment still he makes no mention of its use by others, leading us to infer that it is original so far as he is concerned.

Personally my attention was called to the subject some two years ago while considering the advisability of purchasing one of G. B. Underwood & Co.'s Improved Universal Pulmonary Inspirators, an apparatus that no doubt all of you are familiar with and which many of you have used. So far as I know it is the best one of its kind on the market to-day though I have had no personal experience with it and only speak from the testimony of friends in whom I have the greatest confidence. At this time I looked carefully over a pamphlet compiled by them entitled "A Treatise on the Cure of Diseases of the Pulmonary and Respiratory Organs by the Inhalation of Heated Medicated Air," a copy of which I have if you desire to inspect it. Among the many uses for which they claim their apparatus is of value I noticed this statement on page 5: "Heated medicated air can be used in diseases of the ear, etc., by means of *compressed air*. A short rubber tube to connect the air cylinder and inspirator is all that is necessary for the purpose. Proper rubber attachments are of course required to suit each case." The natural inference is that in case of the ear it was their intention of connecting this apparatus to the Eustachian catheter. As I did not then purchase the apparatus the subject slipped from my mind and I made no practical application of the suggestion, but on reading Dr. Leavitt's

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paper which was sent me by your President for discussion I was reminded of the fact that somewhere this subject had been suggestd to me before and in looking up the subject I came across the remarks I have just quoted. I have been forcibly impressed with its value as a means of treatment and hope at an early date to put it to practical use, and I desire to again thank Dr. Leavitt for bringing it to my attention and trust others like myself have been so impressed. I believe it is a good thing and should be passed around.

Having been convinced of its value as a therapeutic agent one desires to know what is the best method of its application, for much depends upon our future success with its use in having the best apparatus where that is necessary for its application. Dr. Leavitt has shown us his and has asked us to discuss it freely, though at the time of preparing this discussion I had not seen his apparatus, still I was able to consult a very careful drawing of it and I believe I understand the method of its use. It is apparently simple in its construction and adequate for the application of heated air but I question whether it is the best one for the application of medicated heated air. It strikes me that his method of volatilizing or vaporizing his medicaments is too sudden for the proper diffusion of the volatile elements, a point upon which Underwood & Co. lay great stress, and it seems to me that their argument is well taken and worthy of our consideration. They claim a gentle gradual admixture of the volatile elements. I trust there are members present who have used their apparatus and will give us their views as to its adaptability for the treatment of the middle ear diseases.

Since writing this I have to-day seen the heating apparatus in connection with Dr. Houghton's pumps, and it seems to me that the entire apparatus could be utilized to very great advantage in the treatment of middle ear diseases with medicaments. It can be easily attached, I think, to the catheter, and can be used under pressure or can be attached to the new pneuma-chemic nebulizer by a system of Y's. While looking up this subject, I wrote to the pneuma-chemic company of Cincinnati, and it seems to me that they have an apparatus already on the market by which they treat all their medicaments with heat under compressed air, so that there is a number of apparatuses that one can select if they wish to use this treatment.

Dr. Stephenson: I was much interested in the paper of Dr. Leavitt because I have beeen using the same myself, perhaps in a very crude way. I take the ordinary air-condensing tank, pass the air through the nebulizer, then into a copper coil such as is used in distilling, having it long enough so that the air becomes thoroughly warmed in passing through; then with an ordinary Davidson's shut-off attached to the nose piece, you have perfect control of it. I find my patients like it as it is so pleasant, and I think that it is going to produce good results, although I have not used it long enough to state with certainty.

Dr. Linnell: I discarded the Underwood inhaler because in one case I got a pulmonary hæmorrhage from using it. The hæmorrhage followed the use of it, and I attributed it to the effect of the hot air. I be-

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lieve there is an element of danger in using it in some cases where the mucous membrane is sensitive, especially if there is any tendency to this trouble. I think there might be some such danger in otitis. I used in this case a temperature of 300 degrees, which is not excessive.

Dr. Leavitt: There are two points I wish to speak of in conclusion. Dr. Hasbrouck speaks of the advantages of slowness of medication. This is a good point, but must not be carried too far, as theEustachian catheter remains in the tube but a short time;—less than a minute under ordinary conditions. An apparatus in which volatilization takes place slowly enough for a twenty minutes' pulmonary treatment, would not be as suitable for the short period that would be necessary for the middle ear treatment. The fact that the silver catheter often becomes uncomfortably warm is an additional reason for not keeping it in position for too long a time. A hard-rubber catheter would be more suitable for this purpose were it not for the fact that it straightens out from the heat. The ideal instrument would be a silver one, covered with hard rubber.

Dr. Stephenson speaks of heating air by means of a coil. This method has the disadvantage of great variations in the temperature of the air, as so small a quantity is heated at one time. There is danger, also, during the interval of changing the catheter from one nostril to the other that the air in the coil will become superheated, and when it is driven into the tympanum it may alarm or even burn the patient. There is not this danger in an air chamber of greater capacity.

It is true that there are instruments on the market which are represented to be adapted to the treatment of the middle ear. I am sure the devisors of these instruments could never have used them for this purpose, for those that I have seen are not air-tight. This is necessary. If the instrument leaks we cannot get sufficient pressure with a Politzer air-bag, or, if compressed air is used, we may overestimate the leak and use too much force.

Dr. Hasbrouck has suggested medicating the air with a nebulizer, and heating it afterwards. This suggestion strikes me as a valuable one, and when developed may give us the most scientific and accurate method of all.

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Hasbrouck, Sayer.....117 Broad street, Providence, R. I.
Haywood, George M.....830 Granite Building, Rochester, N. Y.
Hazeltine, Burton D.....100 State street, Chicago, Ill.
Heath, Gertrude Emma.....164 Water street, Gardiner, Me.
Helfrich, Charles H.....542 Fifth avenue, New York City.
Hills, Howard B.....31 West Wood street, Youngstown, Ohio.
Hooker, Edward Beecher.....721 Main street, Hartford, Conn.
Horr, Albert W.....7a Beacon street, Boston, Mass.
Houghton, Neidhard H.....867 Boylston street, Boston, Mass.
Hoyt, Herbert W.....75 S. Fitzhugh street, Rochester, N. Y.
Hubbard, Charles H.....Eighth and Madison streets, Chester, Pa.
Humphries, Edward.....Somerton, Philadelphia, Pa.
Hunt, Ella G.....608 West Eighth street, Cincinnati, Ohio.
Irving, Walter W.....121 Wisconsin street, Milwaukee, Wis.
James, Bushrod W.....Eighteenth and Green streets, Philadelphia, Pa.
Jessup, Halten I.....1829 Arch street, Philadelphia, Pa.
Keeler, E. Elmer.....452 South Salina street, Syracuse, N. Y.
Kehr, Samuel S.....600 California Building, Denver, Col.
Kellogg, Francis B.....420 West Sixth street, Los Angeles, Cal.
King, William R.....1422 K street, N. W., Washington, D. C.
Kreider, W. B.....Goshen, Ind.
Leavitt, Henry H.....909 Fourth street, S. E., Minneapolis, Minn.
Lewis, Frederick Daniel.....188 Franklin street, Buffalo, N. Y.
Lewis, F. Park.....454 Franklin street, Buffalo, N. Y.
Lewis, Joseph Davidson.....48 Germania Bank Building, St. Paul, Minn.
Linnell, E. H.....45 Broadway, Norwich, Conn.
MacLachlan, Daniel A.....Majestic Building, Detroit, Mich.
Mann, Eugene L.....681 Endicott Arcade, St. Paul, Minn.
Mann, Jesse E.....Louisville, Ky.
McDermott, George C.....Odd Fellows' Temple, Cincinnati, Ohio.
McDowell, George W.....542 Fifth avenue, New York City.
Moffat, John L.....1036 Dean street, Brooklyn, N. Y.
Moriarty, Pierre Colon.....Bee Building, Omaha, Neb.
Mueller, Gustave A.....400 Pennsylvania avenue, Pittsburg, Pa.
Munson, Edwin Sterling.....16 West Forty-fifth street, New York City.
Nelles, A. B.....198 East State street, Columbus, Ohio.
Newberry, Frank J.....8 North Clinton street, Iowa City, Ia.
Norton, A. B.....16 West Forty-fifth street, New York City.
Paine, Howard S.....148 Ridge street, Glens Falls, N. Y.
Palen, Gilbert J.....6043 Germantown avenue, Philadelphia,, Pa.
Palmer, A. Worrall.....138 West Eighty-first street, New York City.
Palmer, John B.....122 East Twenty-fourth street, New York City.
Parsons, Thomas.....33 South Clinton street, Rochester, N. Y.
Patterson, Joseph M.....Commerce Building, Kansas City, Mo.
Payne, John H.....Pierce Building, Copley square, Boston, Mass.
Pearsall, William S.....128 West Seventy-eighth street, New York City.

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Peterson, A. C.....319 Geary street, San Francisco, Cal.
Phillips, William A.....89 Euclid avenue, Cleveland, Ohio.
Piatti, Virgil C.....Greenwich, Conn.
Quay, Geo. H.....122 Euclid avenue, Cleveland, Ohio.
Reed, Robert G.....20 West Seventh street, Cincinnati, Ohio.
Reilly, William F.....1008 Madison street, Covington, Ky.
Rice, George B.....229 Berkeley street, Boston, Mass.
Richardson, George H.....Patton, Cal.
Rhoads, George.....4 Chestnut street, Springfield, Mass.
Rumsey, Charles Leslie.....819 Park avenue, Baltimore, Md.
Rust, Edwin G.....29 Euclid avenue, Cleveland, Ohio.
Seitz, Frank B.....33 North Pearl street, Buffalo, N. Y.
Schenck, Herbert Dana.....241 McDonough street, Brooklyn, N. Y.
Shallcross, Isaac G.....1617 Arch street, Philadelphia, Pa.
Shearer, Thomas L.....345 North Charles street, Baltimore, Md.
Sheets, Charles A.....
Sheldon, Floyd P.....223 West 122d street, New York City.
Shelton, George G.....521 Madison avenue, New York City.
Shepard, George A.....1672 Broadway, New York City.
Sherman, Le Roy B.....355 West Fourteenth street, New York City.
Short, Zuber N.....428 Central avenue, Hot Springs, Ark.
Smilie, Nathan.....249 East Logan square, Philadelphia, Pa.
Smith, J. W.....Main street, Vevay, Ind.
Smith, Orrin Lelroy.....Forty-seventh and Kenwood avenue, Chicago, Ill.
Soulé, Isaac C.....Kansas City, Mo.
Spahr, Charles E.....10 West Market street, York, Pa.
Spencer, William.....1820 Chestnut street, Philadelphia, Pa.
Stearns, William M.....813 Marshall Field Building, Chicago, Ill.
Stephenson, Benjamin S.....49 Kirk street, Lowell, Mass.
Sterling, Charles F.....32 Adams avenue, W., Detroit, Mich.
Stewart, Thomas M.....704 Elm street, Cincinnati, Ohio.
Storer, John.....1007 Columbus Memorial Building, Chicago, Ill.
Strickler, David A.....705 Fourteenth street, Denver, Col.
Strong, Charles H.....915 Madison street, Toledo, Ohio.
Strong, T. Morris.....176 Huntington avenue, Boston, Mass.
Strong, Walter.....2049 North Thirteenth street, Philadelphia, Pa.
Suffa, George A.....229 Berkeley street, Boston, Mass.
Swan, Charles J.....34 Washington street, Chicago, Ill.
Talbot, George H.....306 Walnut street, Newton, Mass.
Teets, Charles E.....37 West Thirty-ninth street, New York City.
Thomas, Charles M.....1623 Arch street, Philadelphia, Pa.
Townsend, Irving.....67 West Forty-sixth street, New York City.
Valentine, Richard K.....190 Lincoln place, Brooklyn, N. Y.
Van Mater, George G.....354 Macon street, Brooklyn, N. Y.
Vehslage, Samuel H.....117 West Forty-third street, New York City.
Vilas, Charles H.....2811 Cottage Grove avenue, Chicago, Ill.
Ware, Horace B.....Scranton, Pa.

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Warner, Alton G.....194 Schermerhorn street, Brooklyn, N. Y.
Warner, Frank P.....304 Main street, Canandaigua, N. Y.
Weaver, Harry S.....1621 Chestnut street, Philadelphia, Pa.
Wells, David W.....391 Boylston street, Boston, Mass.
Wells, Grove S.....Wells Block, Sistersville, W. Va.
Wilberton, Lawrence G.....Model Block, Winona, Minn.
Wilder, Guert E.....415 College avenue, Sandusky, Ohio.
Willard, Henry S.....102 Washington street, Paterson, N. J.
Wilson, Harold.....32 Adams avenue, W., Detroit, Mich.
Woodburn, William.....609 Walnut street, Des Moines, Iowa.
Wright, Joseph E.....26 High street, Morristown, N. J.

HONORARY MEMBERS.

Wilson, T. P.....15 Archwood avenue, Cleveland, Ohio.
Houghton, Henry C.....7 West Thirty-ninth street, New York City.

CORRESPONDING MEMBERS.

Parenteau, Daniel.....73 rue de Rocher, Paris, France.
Shaw, C. Knox.....19 Upper Wimpole street, London, England.
Wright, Dudley.....55 Queen Anne street, London, England.

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CONSTITUTION.

ARTICLE I.—NAME AND OBJECT.

This Association shall be styled the American Homœopathic Ophthalmological, Otological and Laryngological Society, and its object the study of the eye, ear, nose and throat, with particular reference to Homœopathic therapeutics.

ARTICLE II.—MEMBERS.

The Society shall be composed of those physicians who are already members, and of such others as may be hereafter chosen in conformity with the By-Laws.

ARTICLE III.—QUORUM.

At any meeting of the Society eleven members shall constitute a quorum.

ARTICLE IV.—OFFICERS.

The officers of the Society shall be a President, two Vice-Presidents, a Secretary, and a Treasurer, who shall also constitute an Executive Committee of the Society.

ARTICLE V.—AMENDMENTS.

This Constitution may be altered or amended by a vote of two-thirds of all the members present at the regular annual meeting, provided that notices of such alteration or amendment shall have been given in writing at a previous annual meeting of the Society.

BY-LAWS.

ARTICLE I.—MEETINGS.

This Society shall hold at least one session in each year, at such time, and place as may be determined upon from time to time.

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ARTICLE II.—ELECTION OF OFFICERS.

SECTION 1. The officers shall be elected by ballot at each annual meeting of the Society, and shall enter upon their respective duties the first day of January following.

SEC. 2. The regular chosen officers of this Society shall constitute an Executive Committee, which shall arrange the business of the session, attend to matters of business not otherwise specially provided for, and perform such other duties as may by vote of the Society devolve upon them.

ARTICLE III.—DUTIES OF OFFICERS.

SECTION 1. The President shall preside at the meetings of the Society, and perform such duties as may by vote of the Society be devolved upon him. He shall deliver an address at the opening of each annual session, upon such subject as he may select.

SEC. 2. The Vice-Presidents in their order shall perform the duties of the President in his absence or disability.

SEC. 3. The Secretary shall keep a record of the proceedings of the meetings, conduct the correspondence of the Society, issue notices of meetings, and notify members of their election.

SEC. 4. The Treasurer shall receive all money belonging to the Society, shall make all disbursements under the recommendation of the President, and he shall furnish at each annual meeting a written report of the condition of the finances.

ARTICLE IV.—CENSORS.

There shall be a Board of Censors, consisting of five members, who shall receive and examine the credentials of candidates for membership, and report to the Society for election such as may be found properly qualified. The members of said Board shall be elected by ballot at each annual session to serve for one year from the first day of January next succeeding said election.

ARTICLE V.—MEMBERSHIP.

SECTION 1. Any regular qualified and reputable physician, endorsed by two members, may be elected to membership in this Society.

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SEC. 2. The admission fee of each member of the Society shall be two dollars.

SEC. 3. Members shall pay annually the sum of three dollars toward defraying the expenses of the Society.

SEC. 4. The election of no member shall be considered completed until he shall have paid his admission fee and annual dues; and his membership can only be continued by the annual payment of these dues; until they are paid he may not participate in the active work of the Society. He may at any time within three years, however, complete his membership by paying his dues for the current year, together with any back dues that may have accumulated against him.

SEC. 5. Members neglecting the payment of dues for three years after proper notification from the Treasurer, shall have their names dropped from the roll of membership. Any person thus dropped shall have the privilege of reinstatement by paying all arrearages, on recommendation of the Board of Censors.

SEC. 6. Any physician of eminent attainments in the special fields of medicine with which this Society is concerned, may be elected an Honorary Member on recommendation of the Board of Censors at any annual meeting of the Society, and shall be exempt from dues and shall have all the privileges of members, except voting and eligibility to office.

SEC. 7. Any foreign physician may be elected a Corresponding Member of the Society at any annual meeting, on recommendation of the Board of Censors, and shall have all the privileges of members, except voting and eligibility to office.

ARTICLE VI.—RULES OF ORDER.

SECTION 1. The rules governing the deliberations of this Society shall be those found in Roberts' Rules of Order.

SEC. 2. No report or paper shall be received by the Society in an incomplete or unfinished condition, and the title of any proposed paper shall be forwarded to the Secretary by April 1st of each year and the completed paper by May 1st.

SEC. 3. The time allowed for the presentation of any paper shall be twenty minutes. The leading discussion shall not exceed ten minutes, and all other discussion five minutes for each speaker.

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ARTICLE VII.

These By-Laws may be altered or amended by a vote of two-thirds of the members present at the meeting.

STANDING RESOLUTION.

Resolved, That the Committee on the Nomination of Officers shall consist of all the ex-Presidents of the Society present at any meeting, provided that in any case less than three be present the President shall appoint from the members present a number sufficient to make the Committee consist of three members.

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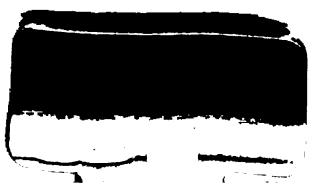

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